This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

3 6105 008 118 098

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

HA3153
A4
1900-1903

Digitized by Google

WESTERN AUSTRALIAN

YEAR-BOOK

FOR

1900-01.

(TWELFTH EDITION.)

BY

MALCOLM A. C. FRASER,

F.R.G.S.; F.R.C. Inst.,

GOVERNMENT STATISTICIAN AND REGISTRAR GENERAL
OF WESTERN AUSTRALIA.

IN TWO VOLUMES.

VOLUME I.

PERTH:
BY AUTHORITY: WM. ALFRED WATSON, GOVERNMENT PRINTER.
1902.

Digitized by Google

Digitized by Google

WESTERN AUSTRALIAN

YEAR-BOOK

FOR

1900-01.

(TWELFTH EDITION.)

NOTE.—Persons who have been supplied with this first volume of the Year Book for 1900-01, and who do not receive the second volume in due course, are requested to notify the Government Statistician, Perth.

VOLUME I.

PERTH:
BY AUTHORITY: WM. ALFRED WATSON, GOVERNMENT PRINTER.
1902.

H

Digitized by Google

Digitized by Google

WESTERN AUSTRALIAN

YEAR-BOOK

FOR

1900-01.

(TWELFTH EDITION.)

BY

MALCOLM A. C. FRASER,

F.R.G.S.; F.R.C. Inst.,

GOVERNMENT STATISTICIAN AND REGISTRAR GENERAL
OF WESTERN AUSTRALIA.

IN TWO VOLUMES.

VOLUME I.

PERTH:
BY AUTHORITY: WM. ALFRED WATSON, GOVERNMENT PRINTER.

1902.

Digitized by Google

HARVARD UNIVERSITY

Digitized by Google

Digitized by Google

Digitized by Google

PREFACE.

For various reasons it has lately been found impossible to publish this book annually. The diversity of the subjects included within its scope, and the consequent multiplicity of the sources from which the requisite information has to be drawn, added to the difficulty evidently experienced by the various Government Departments, whose assistance has necessarily to be obtained, in giving immediate attention to the collection and compilation of the matter asked of them, has rendered it, I regret to say, necessary to publish it as a retrospective survey of the two years immediately preceding that of its issue.

In this twelfth edition will be found, therefore, in addition to the chapters of general reference, a report of the progress made by the State of Western Australia during the years 1900 and 1901, comparative statistical figures being, at the same time, in almost every instance, given for the whole decade 1892-1901.

Some valuable information has been also added in this issue to that previously given. Professor Dr. J. E. Heeres, formerly of Delft, now of Leiden University, has kindly allowed me, with regard to the historical portion relating to the early Dutch discoveries, to avail myself of all the authentic researches contained in his book on "The Part borne by the Dutch in the Discovery of Australia." Again, I am also indebted to Mr. A. Gibb Maitland, the Government Geologist, and his staff, for exhaustive chapters on the Geology and Mineral Resources of Western Australia; to Mr. B. H. Woodward, the Director of the Museum, for a most comprehensive article on her "Fauna"; to Mr. A. Morrison, the Government Botanist, in addition to his excellent contribution on her "Flora," for a thorough revision of the "List of Extra-tropic West Australian Plants," compiled by the late Baron Von Müeller; to Mr. E. S. Simpson, of the Geological Survey, and Mr. C. Erskine May, of the Lands Department, for extremely interesting descriptions of the Caves and Caves District of the South-West; and to Mr. H. M. Giles, of the Zoological Gardens, for a valuably instructive essay on the Insects of the State, whilst the information relative to recent Exploration and the Geographical notes have been fully brought up to date by the kindness of Mr. F. S. Brockman, Chief Inspecting Surveyor of the Lands Department.

83201

Digitized by Google

The heads and officers of several other Government Departments, and the various private persons to whom I have had occasion to refer for information, have again accorded me their invaluable help, and to all these I now beg to express my indebtedness.

It is to me a matter of great regret, considering the wide circulation this book has attained, that the late Ministry decided that means were not available to allow of the inclusion of descriptive illustrations in this issue.

The second volume, which deals more especially with the progress of the State, is now in course of completion.

I shall, as in the past, be glad to receive information respecting any errors that may have crept in or been overlooked.

MALCOLM A. C. FRASER,
Government Statistician and Registrar General.

17th September, 1902.

Digitized by Google

VOLUME I.

CONTENTS.

SUBJECT.	PAGE
PART I.—HISTORY.	
1.—Discovery and Early History of Western Australia ...	1
2.—Colonisation and Early Settlement	19
3.—Historical Events	22
4.—Exploration in Western Australia	50
5.—History of Mineral Discoveries	75
PART II.—DESCRIPTIVE.	
1.—Physical Features	95
2.—Geography	98
3.—The Salient Geological Features of Western Australia ...	103
Census of Minerals of Western Australia	117
Geological Features of the S.W. Caves District ...	124
Description of the Limestone Caves of W.A.	129
4.—Climate	135
5.—Principal Towns and other Centres of Population ...	158
6.—Aborigines of Western Australia	196
7.—Fauna	211
Legislation in connection with Native and Imported Birds and Animals	273
Fish and Fisheries of Western Australia	275
8.—The Insects of Western Australia	285
9.—Flora	298
List of Extra-tropic West Australian Plants	308
10.—Forest Resources	341
PART III.—GOVERNMENT.	
1.—The Commonwealth and the State	359
2.—Governors of Western Australia	370
3.—Early Constitution	371
4.—Present Constitution	378
5.—Local Government	390
6.—Administration of Justice	420
7.—Military Defences	427
PART IV.—PUBLIC WORKS AND INSTITUTIONS.	
1.—Harbour Works	431
2.—Jetty and Wharf Accommodation at the various Ports of the State	441
3.—Boundaries of Ports of Western Australia	444
4.—Description of Lights on Western Australian Coast ..	446
5.—Water Supply and Artesian Bores	451
6.—Royal Mint	479
7.—The Western Australian Museum and Art Gallery ...	481
8.—Victoria Public Library of Western Australia	484
9.—The Observatory	486
10.—The Zoological and Acclimatisation Gardens	489
11.—The King's Park	490

Digitized by Google

Digitized by Google

LIST OF MAPS.

		Page
1.	General Map of the State (Frontispiece)	
2.	Map of Explorations in Western Australia	50
3.	Rainfall and Zoo-Geographical Map of the State	135

Digitized by Google

Digitized by Google

WESTERN AUSTRALIAN YEAR-BOOK

FOR

1900-1901.

VOLUME I.

PART I.—HISTORY.

1.—DISCOVERY AND EARLY HISTORY OF WESTERN AUSTRALIA.

TERRA AUSTRALIS INCOGNITA, or MAGELLANICA, the unknown Southern Continent, or Great Southern Land of ancient geographers and explorers, is said to have been first discovered by the Portuguese between the years 1511 and 1529, when some vessels belonging to that nation, engaged in the exploration of the Indian Seas, driven out of their course by currents or stress of weather, accidentally drifted on to the Australian coast. The authenticity of this account is, however, doubted.

In 1567 Alvaro de Mendaña sailed from Callao, in Peru, in search of the Continent believed to exist in the Southern Seas, but the only result of the expedition was the discovery of the Solomon Islands.

In 1595 Mendaña again left Peru in charge of an expedition equipped for the purpose of colonising the Solomon Islands, previously discovered, and chanced on the Marquesas and Santa Cruz Islands. He died on one of the latter, the expedition returning to Peru.

The spirit of enterprise displayed by the Portuguese served however to encourage the Du ch East India Company, with their already established factories in Java and other parts of the Indian Archipelago, to researches in the direction of Australia. Their first object was New Guinea, where it was rumoured that gold was found. Frederick de Houtman, Governor of Amboyna (in the Moluccas), organised an expedition in 1605. Under his instructions the Dutch yacht "Duyfken" *(Little Dove)*, Commander Willem Jansz, subcargo Jan Lodewijkszoon Rosingeyn, sailed from Batavia for Bantam on the 28th November of that year, whence, after receiving further instructions from Jan Willemsz Verschoor, the

Digitized by Google

company's President, she sailed to explore the Island of New Guinea. During March in the following year she coasted along that portion of *Terra Australis* lying in the Gulf of Carpentaria to the South-West of Cape York, as far as Cape "Keer Weer," or "Turn Back," her commander mistaking it for the West side of New Guinea, and thus, unconsciously, making the first authenticated discovery of the long sought-for Southern Continent. These seem to be all the particulars available as to the results of this expedition, and even they are doubtful, as the journal of Captain Jansz unfortunately appears to have been lost.*

On the 21st December, 1605, Pedro Fernandez de Quiros, who had been pilot under Mendaña and Luiz Vaz de Torres, left Callao with three Spanish vessels in search of the supposed *Tierra Austral*, and amongst others discovered one of the islands now called the New Hebrides, to which, supposing it to be the object of their search, they gave the name of *Australia del Espiritu Santo*. Torres, in the "Almirante," on the 11th June, 1606, found himself separated from De Quiros, and, ascertaining that the newly-discovered land was only an island, continued his search Westward, passing, also unconsciously, in sight of the sought-for continent, through the Straits that now bear his name.

In 1611 certain ships going from the Netherlands to India, after doubling the Cape, followed another route than that usually adopted: they ran on an Eastern course, in about 36° Southern latitude, for a considerable time, and then tried to navigate to Java on a Northerly course. The commander, the subsequent Governor General Hendrik Brouwer, wrote to the Directors of the East India Company concerning "this fairway" in highly laudatory terms, as preferable to the usual course by Madagascar, which offered many dangers and objections. The new route was thenceforth prescribed to the Company's ships. As early as 1618 and 1620 the Company urged upon the Governor General of India the importance of following up the discoveries in the region of "The Southland." Jan Pieterszoon Coen, who was then directing the affairs of the Company in India, gave instructions, on the 29th September, 1622, for the ships "Haring" *(Herring)* and "Hazewind" *(Greyhound)* to sail, "destined for the further discovery of the Southland." The commanders were "specially to inquire what minerals, such as gold, silver, tin, iron, lead, and copper, what precious stones, pearls, vegetables, animals, and fruit these lands" produced; and the countries discovered were "to be taken possession of." Jan Carstensz was to be in command. The ships, however, for some reason did not sail on their ordained expedition. The enterprise of the Company probably found its boldest expression in that eminent navigator, Van Diemen; but in his time the directors of the Company began

* Dr. W. G. C. Byvanck, the Chief Librarian of the Royal Library at The Hague, who has kindly furnished authentic information with regard to the early Dutch voyages to Western Australia, quotes De Jonge, "Rise of the Dutch Dominion in East India," iii., 42-44, and Lants, also P. A. Leupe, "Voyages of the Dutch to New Holland" (in his "Treatise on the Naval Exploits of the Dutch"). Professor Dr. J. E. Heeres, of Delft, in an abstract of valuable notes kindly made available for publication in the Year Book, gives a similar account.

Digitized by Google

to slacken in their zeal for exploration, finding the expenses too great; and gradually the idea of further colonial expansion was abandoned, thus leaving Australia to be colonised by others. At the close of the 17th century Nicolaas Corneliszoon Witsen, Burgomaster of Amsterdam and General Director of the East India Company, with a special view to the enlargement of geographical knowledge, took a diligent part in the preparations for the voyage of skipper De Vlaming. A few years later he bitterly complained of the indifference of many of his countrymen in those days, who did not "care about curious learning from India," but "money only." As Professor Heeres says: "The times of Van Diemen had failed to return; the spirit by which he was imbued no longer presided over the debates on colonial matters."

In 1616 Dirk Hartogs (Hartochsz), in command of the Dutch vessel "Eendragt," or "Eendracht" *(Concord)*, supercargo Cornelis Buysero, outward bound from Holland to the Indies, entered Shark Bay. and gave his name to the island upon the Western side of the Bay. The name "Dor Eylandt" or "Dorre Eylandt" *(Barren Island)* was then, or subsequently, given to the largest island at the entrance of the Bay. A tin plate nailed to a post erected at the North end of Dirk Hartogs Island remained for many years a memento of his visit. His countryman, Willem de Vlaming, who visited the island in 1697, relates that he found the plate on the 4th of February of that year, and taking it away with him, entrusted it for safe keeping to Their Nobilities, the Gentlemen Seventeen of Batavia. He found it difficult to decipher the inscription, but gave a rendering of it which, translated from the Dutch, runs as follows:—

> ANNO 1616, the 25th of October.—Arrived here the ship "Eendracht," of Amsterdam; the first merchant Gillis Miebais of Liege. Dirck Hartogs, of Amsterdam, Captain. 27th Do.—Sailed for Bantam.

On the lower part, cut with a knife, were to be read in Dutch the words:

> The Under Merchant Jan Steyn, Upper Steersman, Pieter Ledoecker of Bil. A° 1616.

Such at least was the wording of the duplicate plate which he caused to be substituted for the one removed.* Subsequent research, however, makes it appear that the latter part of the inscription on the original plate read as follows:—

> The Under Merchant Jan Steyns, Upper Steersman, Gerrit Douwes of Medemblik. A° 1616.

Vlaming's inscription was seen by Captain Hamelin in 1801, and by Baudin, the Commander of the French exploring vessel, "Naturaliste," in 1803. But the plate had disappeared in January, 1822, when King caused a careful search to be made for it. This disappearance can be accounted for by a statement made by De Freycinet to the effect that he had removed it, and deposited it for

* Dr. Byvanck refers to *Major's "Introduction"* to "Early Voyages to Terra Australia," p. 22.

Digitized by Google

safe keeping in the Museum of the French Institute, which fact is referred to in the minutes of the Society, dated the 23rd March, 1821. In spite, however, of this statement, a careful search very recently made by the Secretary * of the Institute has failed to discover its present whereabouts.

Dirk Hartogs examined the coastline between South latitude 26° 30′ and 23°, and called the intervening country "Eendracht's Land."

On the 11th May, 1618, the ship "Zeewolf" (*Seawolf*), from the Netherlands to India, supercargo Pieter Dirkszoon, skipper Haevik Claeszoon Van Hillegom, sighted land in Southern latitude 21° 20′, about "a thousand miles" (German sea-miles) East of Africa.

In July of the same year a Dutch vessel called "Mauritius," supercargo Willem Jansz, skipper Lenaert Jacobsz, touched near the North-West Cape, and discovered the "Willems-rivier" (probably the Ashburton), in lat. 21° 45′ South.

In 1619 a fleet of eleven vessels, under the command of Frederik de Houtman, in the ship "Dordrecht," discovered, on 29th July of that year, a reef lying off this coast, to which the Dutch sailors at once gave the name of "Frederik Houtman's Abrolhos."† It consists of a cluster of rocky islets and outlying reefs, about 45 miles to the West and North-West of Champion Bay. The term Abrolhos is a contraction of the Portuguese words "abri vossos olhos," meaning in English "Open your eyes," and was applied by the Portuguese to outlying coastal dangers. On board one of the ships of Houtman's fleet, the "Amsterdam," was Jacob D'edel, the first merchant (supercargo), and it was after him that the district between Shark Bay and Champion Bay was named "Edel's Land."

In 1622 the Dutch vessel "Leeuwin" *(Lioness)* rounded the Cape at the South-West corner of the Continent, which still bears her name, and examined the shore as far as what subsequently became known as King George III. Sound.

On the 5th July, 1622, a boat arrived at Batavia with ten men, forming part of the crew of an English ship, named the "Trial," and on the 8th her pinnace arrived with 36 men. They stated that they had lost and abandoned their ship with 97 men and the cargo, on certain rocks situated in latitude 20° 10′ South, in the longitude of the Western extremity of Java. These rocks were near a number of broken islands lying very far apart. They said that they had met with this accident through following the course of the Dutch ships. The yacht "Hazewind" was selected to discover those lands, but never started. It is probable that the shipwrecked English sailors were considerably out in their statement as to the

* Dr. Alfred Grandidier, who has kindly revised the portions of this historical abstract, referring to the French voyages.

† Dr. Byvanck refers to Major's "Introduction," p. 86, and the strictures on the passage given by P. A. Leupe, "Treatise on the Naval Exploits of the Dutch," Vol. xxvii. J, Sec. 2, p. 32.

Digitized by Google

longitude of the "Trial" or "Tryal" rocks, which have since been located (*see* the Admiralty's "Australia Directory,") on the South-Western part of the Monte Bello Reef, extending three or four miles North and South, the central and largest rock lying North, distant 5¼ miles, from the North extreme of Barrow Island.

On the 22nd July, 1622, the Dutch ship "'tWapen van Hoorn" (*The Arms of Hoorn*), having sailed from the Texel on the 22nd December, 1621, arrived at Batavia, and reported that she had been in extreme peril near Eendrachtsland.

On the 21st July, 1623, the Dutch ship "Leyden," skipper Klaas Hermansz, sighted Eendrachtsland. This same ship, under the command of Daniel Janssen Cock, sighted "The Southland," on the 28th April, 1626.

On the 16th November, 1623, the yacht "Tortelduyff" (*Turtle-dove*) sailed from the Texel, and, during her voyage to Batavia, where she arrived on the 21st June, 1624, probably discovered and named the Turtledove Shoal.

In the same year (1623), an expedition under Jan Carstensz, from Amboyna, in the vessels "Pera" and "Arnhem," discovered Arnhem Land (Aarnems land), which included the present Northern district of South Australia. The skipper of the "Arnhem," Dirck Melisz, having been killed in an attack by natives, the second mate of the "Pera," Willem Joosten Van Coolsteerdt, was appointed as his successor. This discovery was, in 1636, further completed by Gerrit Thomaszoon Pool and Pieter Pieterszoon.

In January, 1627, the "Gulde Zeepærd" (*Golden Sea Horse*), skipper François Thyssen, having on board Pieter Nuyts, afterwards Ambassador to the Court of Japan, and subsequently Governor of Formosa, sighted Cape Leeuwin, and made a close examination of the Southern coastline. Nuyts gave the name of Nuyts Land to the country lying round what is now known as the Great Australian Bight. It was on this voyage also that the islands St. François and St. Peter in Nuyts Archipelago, off the coast of South Australia, were named.

On the 22nd July, 1627, the Governor General of Dutch India, Jan Pieterszoon Coen, sailed from Table Bay with the ships "Galias," "Utrecht," and "Texel." The "Galias," having broken her rudder in a gale in the night of the 10th August, parted company from the other ships, and on the 5th September was nearly wrecked on the coast of Eendrachtsland.

On the 17th September of the same year the ship "Het Wapen Van Hoorn," supercargo J. Van Roosenbergh, sighted Eendrachtsland, near Dirk Hartogs Roadstead. Fresh observations were made during each of these voyages, and the coast consequently became more accurately defined on the map.

In 1628 an expedition was equipped in Holland, bound for the East Indies. It had originally been intended that the fleet should consist of eleven vessels, but three of them, being ready

Digitized by Google

to sail before the others, left Texel on the 28th of October, under the command of Commodore Francis Pelsart. The "Batavia," Pelsart's ship, driven out of her course during a severe storm, was separated from the other two, and having lost her reckoning, struck, on the night of the 4th June, 1629, on one of the islands of Houtman's Abrolhos, becoming a total wreck. The greater part of the crew and passengers, however, safely reached the shore. After vainly searching for water on the adjacent islands, and the mainland opposite, Pelsart, with eight men, eventually made his way in one of the vessel's boats to Batavia, where he arrived on the 5th July; here he obtained the use of a frigate called the "Sardam," in which he returned to rescue the remainder of the castaways. On his arrival he found that during his absence a portion of the crew, under the supercargo, Jerome Cornelis, had mutinied, and massacred the greater number of the passengers, intending to seize any vessel that might chance to come near the islands, and then turn pirates. Pelsart, being forewarned of this intention by some of those who had escaped from the mutineers to another island, easily captured the ringleaders, who were promptly tried and as quickly executed, two of their number being marooned on the mainland near Champion Bay. On the 28th October, 1629, the chief part of the silver treasure having been recovered from the wrecked vessel, the "Sardam," with the survivors on board, sailed for Batavia. Pelsart's Journal mentions the so-called "Jacob Remessens," "Remens," or "Rommer" River, in latitude 22° 17′. As the modern maps show no river of any size at that point, it may perhaps be surmised that Exmouth Gulf was mistaken for the mouth of a river. It is evident that the name "Jacob Remessens Rivier" had been given in or before 1628.

In the same year, 1628, Captain Gerrit Fredericsz De Wit, of the homeward bound "Vianen," ran aground off the land which is now comprised in the North-West and Kimberley Districts, and sailing along the coast for about 50 miles, gave his name to that part of Australia.

In 1629 the West coast of Australia was touched at by Dutch vessels in the neighbourhood of Dirk Hartogs Roadstead.

In 1632 the Trials were passed by Dutch ships on the outward voyage, but no fresh information of importance was gained.

In 1635, on the 25th May, the ship "Amsterdam," under Commander Wollebrand Geleynszoon de Jongh, and skipper Pieter Dirksz, sighted the "Southland" in the neighbourhood of Shark Bay.

In 1644 Abel Janszoon Tasman, the celebrated Dutch explorer, and Frans Jacobszoon Visscher, with the yachts "Limmen," "Zeemeeuw" *(Sea-mew)* and "De Brak" *(The Hound)* during a second expedition in these seas, examined the country which was afterwards called Tasman Land, to that bordering on the extreme North-Western coast line of the Continent, from Arnhem Land, or

Digitized by Google

what is now the Northern Territory of South Australia, to Exmouth Gulf, in latitude 22° S. in this Colony. This comprised the country previously discovered, and named by De Wit, as well as part of Eendracht's Land—namely, the present districts of Kimberley and the North-West. Tasman appears to have landed in what was subsequently called Roebuck Bay, and also on some of the islands in Dampier's Archipelago. He gave the name of *Nova Hollandia* or *New Holland* to what is now the Continent of Australia.

An exploratory voyage to the West coast of New Holland was made in 1648 by the ship "Leeuwerik" (*Lark*), commanded by Jan Janszoon Zeeuw.

In 1656, on the 28th April, the "De Vergulde Draeck" *(The Gilt Dragon)*, commanded by Pieter Albertsz, which had left Texel on the 4th October, 1655, was wrecked at night on a reef on the West Coast in latitude 30° 40′, and 118 lives were lost. Leaving 68 of the survivors of the wreck behind on the mainland to protect, if possible, the treasure (78,600 guilders) and merchandise, which comprised the cargo of the vessel, one of the vessel's boats made for Batavia, which it duly reached; and the vessels "Witte Valck" *(White Falcon)*, and "Goede Hoop" *(Good Hope)* were at once despatched to the rescue of the castaways and the property, unfortunately, however, without success.

In 1657 a further search made by the "Vinck" *(Finch)*, whilst on a voyage from the Cape to Batavia, also proved fruitless.

In 1658, on the 1st January, the vessels "Waekende Boey" *(The Watch Buoy)* commanded by Samuel Volckertszoon, and the "Emeloort," Captain Aucke Pieterszoon Jonck, left Batavia on a similar errand, which was equally abortive. Improved charts of the West coast of Australia were, however, the result of this expedition. During the search, one of the boats of the "Waekende Boey," being accidentally separated from her during bad weather, was thought by those on board to have been lost, and was consequently abandoned; part of its crew, however, after almost incredible sufferings from exposure, hunger, and thirst, managed to reach Java in safety.

In the same year the ship "Elburg," commanded by Jacob Pieterszoon Peereboom, brought in further reports about the South-West coast, or "Land van de Leeuwin," where she had been at anchor "in latitude 33° 14′ South under a projecting point," probably in Geographe Bay, and where some of her crew had been ashore.

In February, 1678, the ship "De Vliegende Zwaan" *(The Flying Swan)*, commanded by Jan Van der Wall, coasted the North-West of Australia on her voyage from Ternate to Batavia.

In 1688, on the 5th January, the first Englishman landed on the coast of Western Australia, in the person of William Dampier, who, by the publication of further authentic information regarding "New Holland," supplemented the accounts of Tasman's discoveries made in 1642-3, which had been already previously made known,

Digitized by Google

in 1671 in the diary kept by the surgeon of Tasman's vessel, and subsequently in Tasman's own notes in 1674. Dampier appears to have left Brazil as supercargo in a small vessel called the "Cygnet," commanded by a friend of his named Swan, and intended for the trade with South America; the crew, however, mutinied and became buccaneers, and eventually Captain Swan and about forty of those who remained faithful to him were abandoned to their fate on one of the Philippine Islands. Dampier remained in the vessel, which, after her extended voyage, appears to have required overhauling. Their occupation rendering an unfrequented spot desirable for the purpose, the buccaneers steered for the coast of New Holland, and on the 4th of January, 1688, anchored in a bay in the North-Western corner of King Sound, in the present West Kimberley District, now known as Cygnet Bay, where they beached the vessel and executed the necessary repairs. During their stay here (and they did not leave until the 12th March) Dampier, who does not seem to have found the society of the buccaneers or their mode of life congenial, made a careful exploration of the surrounding country. He succeeded in leaving the vessel at the Nicobar Islands, from which he reached Sumatra in a canoe, and eventually, after many adventures, arrived in England It has been pointed out as a singular circumstance that Cygnet Bay, where the "Cygnet" was beached in 1688, is the one spot out of the whole West Australian coast now selected by the W.A.S.N. Co's s.s. "Australind" and other steamers for scraping and cleaning their bottoms; and it certainly seems strange, unless the place was previously known, that the "Cygnet" should accidentally have hit upon the one place on the whole coast best suited for the purpose.

In 1696 Commander Willem de Vlaming, in a vessel called the "Geelvinck" *(Yellow Bunting)*, convoying two other vessels, the "Nyptangh" *(Pincher)*, commanded by Captain Gerrit Collaert, and "Weseltje" *(Weazel)* under Commander Cornelis de Vlaming, son of the leader of the expedition, was ordered by the Dutch East India Company to carefully examine the Western coast of New Holland for traces of a vessel named the "Ridderschap Van Holland" *(Chamber of Knights of Holland)*, which had left Holland, for the Dutch colonies two years previously (1694)* and had never reached its destination. On the morning of Christmas Day, 1696, land was sighted, and on the 29th the ships anchored off the island of Rottnest, which the next day they explored, giving it the name "Rottenest" from the abundance of rats' (wallabies) nests found upon it. On the morning of the 5th January, Vlaming landed on the mainland, probably somewhere about what is now called Cottesloe Beach, with a party of eighty-six men, fully armed, and marching Eastwards, came to what is described as "a large basin of brackish water, which we afterwards found was a river." On the banks of this they found a hut "of a worse description than that of a Hottentot," also footprints

*Leupe, p. 360.

Digitized by Google

and other evidences of the inhabitants, of whom, however, they were unable to catch a glimpse. On the following day the party divided into three, and went in different directions—one North, one South, and the third four miles further East. On the 9th the ships were brought in and anchored close off the mouth of the river, which Vlaming himself is said to have explored for a distance of fourteen or sixteen leagues. It is mentioned that he caught some smelts, whilst on the surface of the water were seen numerous black swans. Of this hitherto unknown prodigy, the fabulous black swan, Juvenal's "*Rara avis in terris nigroque simillima cygno*," Vlaming captured several specimens, three of which were taken alive to Batavia. The river was named the Black Swan River, and on the 13th January, having, as it is reported, found "neither good country nor seen anything worthy of note," the expedition proceeded slowly Northwards, examining the shore carefully with the boats for traces of the lost ship, and occasionally landing and making short excursions inland. On the 4th February Shark Bay was reached, and carefully explored. The tin plate of Dirk Hartog was discovered, and, leaving a somewhat similar memorial of their own visit, the ships, on the 12th February, proceeded as far as the North-West Cape, from which on the 21st of the same month, they steered a direct course to Batavia.

In 1699 Dampier—who, since his arrival in England, had published accounts of his previous adventures and discoveries in New Holland—was sent by William III. in the "Roebuck," under an Admiralty Commission, to make further explorations on the North-West coast of that country, and to solve, if possible, the question as to whether it was a continent or, as was then generally supposed, only a succession of islands. On the 1st August, 1699, he entered and named Shark Bay, and here he spent eight days in a fruitless search for water. Frequent further attempts for a like purpose, as he proceeded slowly Northward up the coast, were also of no avail, and only once was water obtained in a sufficient quantity to replenish his supply. So greatly disgusted was he with the extreme sterility and waterless aspect of the coastal country—he never appears to have explored any distance inland—that he abandoned the object of his mission, and proceeded straight to New Guinea. His unfavourable comments on the barren appearance of the land, and its wretched poverty-stricken inhabitants—whom he describes as "the miserablest people in the world"—militated strongly against further investigation being made, and from that time to 1770—when Cook, landing at Botany Bay, discovered and took possession of the more fertile regions of the Eastern coast—Australian exploration, so far at all events as England was concerned, appears to have been neglected. During this voyage Dampier discovered and roughly charted the Dampier Archipelago, and added much to the knowledge of the habits and customs of the aborigines and the natural history of the country. He described the kangaroo as "a strange creature like a racoon, which used only its hind legs, and, instead of walking, advanced by great bounds or leaps, of twelve or fifteen feet at a time."

Digitized by Google

With regard to the early history of the gold discoveries in this Colony, a curious mistake has crept in and been perpetuated from time to time in both official and private publications. It is stated that Dampier, a *Dutch* buccaneer, discovered gold on the North-West coast in 1688, and that on account of this discovery the Dutch charts marked this region *Provincia Aurifera*. In the first place Dampier was not a Dutchman, but holds the proud distinction of being the first Englishman to land upon this coast; and, in the second place, no discovery of gold is anywhere mentioned by him in his account of his visit.

Mr. C. H. Coote, of the Department of Maps and Drawings in the British Museum, on being referred to for a solution of this question, replied as follows:—

"The legend of 'Beach,' *Provincia Aurifera*, does not occur on the Chart No. 90,056 (1), Dampier's, but amongst others on the map of the world by Pieter Plancius, the Dutch Geographer, 1594.

"The whole thing is a myth and a geographical blunder of the first half of the 16th century.

"You will find it on the Mercator's large chart of 1569, and on his earlier Earth's Globe of 1541.

"It arose from a misreading of Marco Polo's 'De Regionibus Orientalibus,' lib. 3, caput 2, inserted in Grynæus' (S.) 'Novus Orbis,' 1537 (Yule's 'Marco Polo,' Bk. 3, chap. 7, note 3); Beach or Bœach is a misprint for Locack (Lokok, the Chinese name for a former province of Lower Siam). This was ignorantly transferred by the early 16th century geographers to an imaginary great Southern Continent, the N.W. corner of which was supposed to be the two provinces of '*Beach, Provincia Aurifera*'—'*Maletur* regnum' with '*Lucack* regnum' repeated, in ignorance of the latter being the correct reading of *Beach*."

In March, 1705, a small Dutch exploring squadron of three vessels, the "Vossenbosch" under Maarten Van Delft, "De Wayer" under Andries Rooseboom of Hamburg, and "Nieuw Holland" under Pieter Hendrikszoon of Hamburg, left Timor to explore the North-Western coast of New Holland, and an improved chart of Tasman's explorations was made.

In 1711 a Dutch vessel named the "Zuytdorp" (*The South Village*) is said to have been wrecked on the Abrolhos Islands.

In 1727, on the 9th June, a Dutch vessel, commanded by Jan Steyns, subcargo, Jan Nebbens, the "Zeewyck," so named after a small fishing village in Holland, was wrecked on a reef off, the Houtman Abrolhos, near the island to which, in 1840, Captain Stokes gave the name of Gun Island, from the fact of his finding a small brass three-pounder gun on it, with other relics of the wrecked vessel. Leaving the island on the 26th of March following, the remainder of the crew of the

Digitized by Google

"Zeewyck," 82 in all, taking with them ten chests of treasure valued at 315,836 florins, reached Batavia in safety, on the 21st April, in a small boat built out of fragments of the wreck. A boat previously despatched in charge of the upper steersman, Pieter Langeweg, with a crew of eleven, was never again heard of. Numerous relics of the wreck have since been discovered, including pieces of ordnance, cannon balls, clay pipes, broken gin bottles, tumblers, wine glasses, iron lamps, snuff-box, etc., and several silver and copper coins bearing date 1720 and 1722.

Later in the eighteenth century, *inter alia* in 1755 and 1765, the West coast of Australia was again visited by Dutch ships, but the information gained by these visits is unimportant.

On the 18th March, 1772, Captain de St. Alouarn, in the "Le Gros Ventre," anchored off Cape Leeuwin. After him the St. Alouarn Islands were named by d'Entrecasteaux, in December, 1792.

In 1791, on the 1st April, Captain George Vancouver, who had previously served as a midshipman under Cook, left Falmouth in H.M.S. "Discovery," accompanied by Captain Broughton, in H.M.S. "Chatham," on his way to North-West America, *viâ* the Southern Coast of Australia. On September the 26th he arrived off Chatham Island, which is situated close to the mainland off Point Nuyts, about one hundred miles South-East from Cape Leeuwin. From Chatham Island he made a careful survey of the coast as he proceeded Eastward. On the 28th he discovered a sound, to which he gave the name of King George the Third Sound. Here he remained until the 11th of October, being especially minute in his survey and examination of its outer harbour, and the adjacent country. Continuing his voyage adverse weather greatly interfered with his exploration of the coast, which, when somewhere in the neighbourhood of Esperance Bay, he eventually quitted for America. Archibald Menzies was naturalist and botanist to the expedition.

In 1792 a French expedition of two vessels, one "La Recherche," commanded by Antoine Raymond Joseph de Bruni Chevalier d'Entrecasteaux, and the other called "L'Espérance," Captain Huon de Kermadec, appeared on the South-Western coast, looking for traces of Count Jean François La Perouse, who, early in 1788, had left Sydney with the vessels "Boussole" and "Astrolabe," the latter commanded by Captain de Lange, and whose fate remained a mystery for nearly forty years, until 1825, when Captain Peter Dillon, of H.M.S. "Research," discovered remnants of the wrecks on Vanikoro, or Matlikoro, an island to the North-West of the New Hebrides, being the Southernmost of the Santa Cruz group. D'Entrecasteaux died on board his ship "La Recherche" on 20th July, 1793. Monsieur Labillardière was naturalist to the expedition.

Digitized by Google

In 1801, on the 18th of July, Captain Matthew Flinders left Spithead in the "Investigator," a sloop of 334 tons. He reached Cape Leeuwin on the 6th November, and commencing at King George III Sound, where he arrived on the 9th December, he explored and charted Princess Royal Harbour, and carefully examined the whole of the Southern coast of the continent as far as Bass Straits. On board the "Investigator" was Robert Brown, the well-known botanist; also William Westall, the famous painter; whilst John Franklin, who afterwards became Governor of Van Diemen's Land, and finally ended his career as the celebrated Arctic explorer, was one of her lieutenants. In 1814, upon Captain Flinders' suggestion, the continent received its name of Australia, "as being," as he said, "more agreeable to the ear, and an assimilation to the names of the other great portions of the earth."

In 1801-2 a further search for traces of Count La Perouse was undertaken by a French expedition of three vessels: the "Geographe," commanded by Commodore Nicholas Baudin; the "Naturaliste," by Captain Hamelin; and a small vessel called the "Casuarina," under Captain Louis Desaulses de Freycinet. The whole of the Western coast between Cape Leeuwin on the South, and Cape Lévêque to the North, was minutely but unsuccessfully examined. On their return Southward they anchored off the mouth of the Swan River, and explored as far as the islands, which form a part of the present Perth Causeway, and which yet retain the name of Heirison Islands, given to them by M. Heirison, one of the officers. M. Leschenault, the celebrated botanist, was attached to this expedition, as was also M. François Peron, the zoologist.

In 1810 Captain de Freycinet was again exploring off the Western and North-Western coasts. An account of this voyage is given by Gaudichaud, the botanist, in his "Voyage Botanique autour du monde."

In 1818-22 Lieutenant Phillip Parker King, in the first place in the colonial cutter "Mermaid," 84 tons, and secondly in the brig "Bathurst," 170 tons, both vessels having been specially purchased for the purpose in Sydney, carried out a careful survey of the whole of the Western coast, commencing from King George III Sound to Cambridge Gulf, and continuing along the Northern coast. King's instructions from the Admiralty were to explore the yet undiscovered coast of New Holland, and to complete, if possible, its circumnavigation, also to examine minutely all gulfs and openings in the Northern coast for any river on that part likely to lead to an interior navigation of the continent. Mr. Allan Cunningham was the botanical collector of the party, and one of the two master's mates was Mr. John Septimus Roe, afterwards the first Surveyor General of this Colony. King's charts and sailing directions still form the basis of those in use at the present day. He died a Rear Admiral in 1855.

Digitized by Google

In June, 1825, the French vessels "Thétis" and "Espérance," commanded respectively by De Bougainville and du Camper, were cruising about the Southern coast; and, as it was at that time strongly suspected that France desired to found a settlement in Australia, Lieutenant-General Sir Ralph Darling, then Governor of New South Wales, sent Major Lockyer, with a detachment of the 39th Regiment, and a party of convicts, numbering all told about 75, to found a settlement at King George III Sound. The expedition landed at the Sound on the 25th December, 1825.

The names which were originally given to the most prominent features on the Western coast are still in most instances retained, and serve to perpetuate the memory of many of the earliest explorers, their vessels, and the principal officers of their crews.

In 1827, on the 17th January, Captain James Stirling, R.N., in H.M.S. "Success," having on board as a passenger Mr. Charles Fraser, the Colonial Botanist of New South Wales, sailed from Sydney to examine the country in the vicinity of the Swan River, with a view to the establishment of a settlement. On the 4th March Cape Leeuwin was weathered; Rottnest Island was reached and explored on the 5th March, and the next day the vessel anchored off the mouth of the Swan. On the following day the ship was moored at Berthollet Island, now called Carnac, and on the 8th the first gig and cutter, victualled for a fortnight, and well armed, proceeded up the Swan River, which the party explored to its supposed source, experiencing, however, in doing so, great difficulty in getting their boats across the shallows near Heirison Islands. Two gardens were planted about 15 miles up the river, and friendly relations were established, by means of presents, with a party of natives whom they met with on the 9th, and who, the records of the expedition mention, "seemed particularly fond of bread and sugar," but who "could not relish salt meat." Abundance of swans and ducks were shot, the soil of the banks was examined, fresh water was found to be easily obtainable, and an ascent of the Darling Hills was made by Mr. Fraser. The cutter then returned to the ship, leaving the gig to make a hurried exploration of another river, to which the previous French explorers had given the name of the Moreau, now called the Canning, which they satisfactorily accomplished. After this the crew were employed in surveying the Islands of Rottnest, Berthollet, and Bûache, and the adjacent rocks. On Bûache a garden, from which it probably derived its present name of Garden Island, was planted, and a cow, three goats, and three sheep were left there. The "Success," on the 21st March, 1827, sailed for Geographe Bay, which was reached on the 24th; on the 2nd April she arrived at King George III Sound, where, it is said, they found the settlement by no means reached expectation. Leaving there on the 4th, the anchor was dropped in Port Jackson on the morning of the 15th April, 1827. Both Captain Stirling and Mr. Fraser appear to have been greatly

Digitized by Google

impressed with the capabilities of the newly examined country, the latter making the following entry in his journal:—

"In delivering my opinion on the whole of the lands seen on the banks "of the Swan, I hesitate not in pronouncing it superior to any I have seen "in New South Wales, Eastward of the Blue Mountains, not only in its "local situation, but in the many existing advantages which it holds out to "settlers, viz.:—

"1st. The evident superiority of the soil.

"2nd. The facility with which settlers can bring their farms into "a state of culture from the open state of the country, the "trees not averaging more than ten to the acre.

"3rd. The great advantage of fresh-water springs of the best "quality, and consequent permanent humidity of the soil— "two advantages not existing Eastward of the Blue Moun- "tains.

"4th. The advantage of water carriage to their own doors, and the "non-existence of impediments to land carriage."

The favourable report made by Captain Stirling, backed up by the glowing description given by Mr. Fraser, induced General Darling to recommend the Home Government to at once establish a Settlement; and to Captain James Stirling, who appears to have conveyed the recommendation in person to England, the charge of organising the expedition was entrusted by the English Government.

No commission was at that time issued to Captain Stirling as Lieutenant Governor of Western Australia, who instead received a letter of appointment, bearing date the 30th of December, 1828; the earliest commission issued to him was that appointing him to be Governor and Commander-in-Chief, which was dated 4th March, 1831. The reason for the adoption of this course is explained in the following despatch from Secretary Sir George Murray, addressed to him on the same date as the first letter of appointment, and instructing him as to the course to be followed in the formation of the then proposed settlement:—

"It having been determined by His Majesty's Government to occupy the post on the Western Coast of New Holland, at the mouth of the river called "Swan River," with the adjacent territory, for the purpose of forming a settlement there, His Majesty has been pleased to approve the selection of yourself to have the command of the expedition appointed for that service, and the superintendence of the proposed settlement.

"You will accordingly repair, with all practicable despatch, to the place of your destination, on board the vessel which has been provided for that purpose.

"As Swan River and the adjacent territory are not within the limits of any existing colony, difficulties may easily be anticipated in the course of your proceedings, from the absence of all civil institutions, legislative, judicial, or financial.

"Until provision can be made in due form of law for the Government of the projected colony, the difficulties to which I refer must be combated, and will, I trust, be overcome by your own firmness and discretion.

Digitized by Google

"You will assume the title of Lieutenant Governor, and in that character will correspond with this department respecting your proceedings and the wants and prospects of the settlement you are to form.

"Amongst your earliest duties will be that of determining the most convenient site for a town to be erected as the future seat of Government.

"You will be called upon to weigh maturely the advantages which may arise from placing it on so secure a situation as may be afforded on various points of the Swan River, against those which may follow from establishing it on so fine a port for the reception of shipping as Cockburn Sound is represented to be; and more effectually to guard against the evils to be apprehended from an improvident disposal of the land in the immediate vicinity of the town, you will take care that a square of three miles (or one thousand nine hundred and twenty acres) is reserved for its future extensions; and that the land within this space is not granted away (as in ordinary cases), but shall be held upon leases from the Crown, for a term not exceeding twenty-one years. You will, from the commencement of the undertaking, be observant of the necessity of making out and reserving, for public purposes, all those peculiar positions within, or in the vicinity of the projected town, which, from natural advantages or otherwise, will probably be essential to the future welfare of the settlement. In laying the foundations of any such town, care must be taken to proceed upon a regular plan, leaving all vacant places which will in future times be required for thoroughfares, and as the sites of churches, cemeteries, and other public works of utility and general convenience.

"You will cause it to be understood that His Majesty has granted to you the power of making all necessary locations of land. For your guidance in this respect ample instructions will, at a future period, be prepared. In the meantime I enclose a copy of the instructions of the Governor of New South Wales on this subject, to which you will adhere as closely as circumstances will admit.

"You will bear in mind that in all locations of territory, a due proportion must be reserved for the Crown, as well as for the maintenance of the clergy, support of establishments for the purposes of religion, and the education of youth; concerning which objects more particulars will be transmitted to you hereafter.

"I think it necessary also to caution you thus early (as land on the sea or river side will naturally be the first to be located) that you must be careful not to grant more than a due proportion of sea or river frontage to any settler. The great advantages to be derived from an easy water communication will, of course, not escape your consideration, and this advantage should be divided amongst as many settlers as can conveniently benefit by their position in the vicinity.

"In regard to the surveys and explorations of the country, which you may think it right to set on foot, it is perhaps premature to give you any instructions upon a point when so much must be left to your own discretion and intelligence as to the nature of the soil and of the country, which you may obtain on the spot; looking, however, to the future prospects of the settlement, and the advantages of its local position, I should be inclined to think that it will be expedient to make the country South of Swan River the scene of your labours, rather than the tract of country North of that stream, and that you will do well to invite the settlers to locate themselves according to this suggestion.

"You will endeavour to settle, with the consent of the parties concerned a court of arbitration for the decision of such questions of civil rights as may arise between the early settlers, and until a more regular form of administering justice can be organised.

Digitized by Google

"You will recommend, by your counsels and example, the habitual observance of Sunday as a day of rest and public worship, as far as may be compatible with the circumstances in which you may be placed.

"With these few and general instructions for your guidance, assisted by the oral and written communications which have taken place between yourself and this Department, you will, I trust, be able to surmount the difficulties to which you may be exposed at the outset, enhanced as they will be by the want of any regular commission for administering the Government.

"An instrument of that nature, accompanied with all the requisite instructions, will be transmitted to you as soon as the indispensable form of proceeding in such cases will allow."

In 1829, on the 2nd May, Captain Chas. H. Fremantle, of H.M.S. "Challenger," who had been despatched from the Cape of Good Hope on the 20th March of that year, by Commodore Schomberg, of the Indian Squadron, for the purpose, anchored off the mouth of the Swan River, and, hoisting the British flag on the South head, took formal possession, in the name of His Majesty King George IV., of "all that part of New Holland which is not included within the territory of New South Wales."

Exactly one month later, on the 2nd June, the hired transport "Parmelia," 448 tons, J. H. Luscombe, commander, arrived in Cockburn Sound, having on board Lieutenant-Governor Stirling, his family, and other intended settlers, numbering in all 69. Six days later, on the 8th June, her consort, H.M.S. "Sulphur," arrived with a detachment (Light Company No. 2) of the 63rd Regiment, consisting of 3 subalterns, 1 staff officer, 2 sergeants, 3 corporals, 1 bugler, and 46 men, under the command of Captain F. C. Irwin. Having left a party of about half its strength to protect the stores, settlers, etc., on Garden Island, the remainder of the force, on the 17th June, disembarked, and encamped on the North bank of the Swan, now Rous Head, relieving the party of seamen and marines from the "Challenger," which had been left to protect the British flag planted there by Captain Fremantle during the preceding month. With the landing of the emigrants from the "Parmelia," the history of Western Australia, as a British Colony, begins.

The following account of the arrival of the first settlers was contained in a despatch sent by Captain Fremantle to the Admiralty, from Trincomalee, on the 8th October, 1829:—

"The 'Challenger' arrived and anchored off Garden Island (late Isle Blanche of the French) on the 25th April, 1829, and on the 27th proceeded through the passage into Cockburn Sound, which is most rocky and intricate, in consequence of which she struck on a sunken rock; but I do not anticipate that she has received any damage, as she came off immediately, and makes no water. On the 28th she was secured in the Sound, and possession was immediately taken of Garden Island. Fresh water was found by digging wells in the sand, and firewood in great abundance, the island being covered with a small kind of pine, and fit for no other use.

Digitized by Google

"The weather being unsettled and boisterous, it was not till the 2nd of May that I could land at the Swan River, distant 9½ miles from Cockburn Sound. On that day formal possession was taken of the whole of the West coast of New Holland in the name of His Britannic Majesty, and the Union Jack was hoisted on the South head of the river.

"On the 6th of May a party of 25 men, under the command of Lieutenant John Henry, was landed in a little bay close to the mouth of the river, to the Southward of it, being the only landing place in that neighbourhood where boats could go to with security, the bar at the entrance of the river generally being impassable; the crew of the 'Challenger' were employed refitting and watering the ship.

"On the 1st of June a merchant ship was reported in the offing, and on the 2nd she was seen standing into Gage Roads. She proved to be the 'Parmelia,' merchant ship, hired by Government, having on board Captain Stirling, R.N., appointed Lieutenant-Governor of the new settlement at Swan River, and other gentlemen, with their families, holding situations in the Colony. In running into Cockburn Sound she grounded on the bank between Pulo Carnac (or Isle Bartollet of the French) and Woodman's Point on the Main, and it was not until the next morning, with all the exertions of this ship's crew and boats, that she was extricated from her perilous situation, after she had received much damage; she was subsequently brought near the 'Challenger' and secured in Cockburn Sound. His Excellency the Lieutenant-Governor having determined to make his first landing on Garden Island, in consequence of the commencement of the winter season, the weather being generally boisterous, rainy, and unsettled, and the communication with the mainland very uncertain, he requested that I would render him all the assistance of the 'Challenger's' crew in clearing parts of the island, building houses for himself and the rest of the colonists, and clear the transport as soon as a storehouse could be erected for the reception of the Government stores. I immediately employed every means in my power to forward his wishes, and the 'Challenger's' crew were employed in any way the Lieutenant-Governor wished, for the benefit of the Colony.

"On the 8th June His Majesty's ship 'Sulphur' anchored in Cockburn Sound, with a detachment of troops on board for Swan River. On the 17th they were disembarked, and part of them sent to relieve the marines and seamen of this ship at the mouth of the River, the weather being so boisterous as to prevent their landing on the main sooner. By the end of the month, having completed all the storehouses and landed most of the cargo from the 'Parmelia,' His Majesty's ship was prepared for sea to join the Commander-in-Chief in India, in compliance with orders received by His Majesty's ship 'Sulphur' to that effect, when I received an application from the master of the 'Parmelia,' as also a requisition from the Lieutenant-Governor, to heave down and make good the

Digitized by Google

defects of that ship, as she had received much damage and could not pursue her voyage, and if this ship was to leave the anchorage without rendering her the assistance required, the 'Parmelia' would be abandoned. I therefore considered it my duty, after ordering a survey to be held on her, to detain His Majesty's ship in Cockburn Sound, and to put her in a state to pursue her voyage, an account of which has been delivered to Rear-Admiral Sir Edward Owen; and it was not till the 28th of August that the 'Challenger' was enabled to leave Swan River. On leaving the Colony I have to state that two ships have arrived from England with settlers, and one from the Cape of Good Hope with cattle; many others were expected. The Lieutenant-Governor had fixed on a site for a town about 12 miles up the Swan River, on the right bank, just below the islands, where he intended removing to immediately with the whole of the party landed on Garden Island. The town is to be called Perth; there is also another town to be built at the mouth of the river for the convenience of the shipping in Gage Roads, near the spot where the party from the ship first established themselves. The number of settlers arrived from England, including women and children, were about 150, making the whole party now at Swan River amount to nearly 300 persons; they had upwards of a twelvemonth's provisions, and were perfectly healthy. The soil of the sea coast was generally sandy, but on arriving at the fresh water in the Swan and Canning rivers, the banks were rich, and the soil capable of producing anything.

"I cannot conclude without making some remarks on the anchorage in Cockburn Sound, which we had a good opportunity of trying, having remained there for the three winter months in the greatest security, and I consider it to be a safe and good harbour, capable of containing any number of ships; unfortunately the passage in is intricate, and requires to be well buoyed; at present it cannot be approached without the greatest caution, and ought not to be attempted except in the finest weather.

"Gage Roads is open to four points, which makes it at present a doubtful anchorage during the winter months; but for nine months ships may ride there with safety, and the approach is perfectly easy, as there are no dangers to the Northward of Rottnest Island to the mouth of the Swan River."

Digitized by Google

2.—COLONISATION AND EARLY SETTLEMENT.

In order to induce persons to proceed to the contemplated Settlement on the Swan River, the Home Government, whilst refusing to incur any expense of passages, maintenance on arrival, or subsequent removal from the Colony, if found necessary, promised that all persons arriving before the end of the year 1830 should receive grants of land free of quit rent in proportion to the capital introduced by them, to be invested in the improvement of the lands, at the rate of 40 acres for every sum of £3 invested, or 1s. 6d. per acre; choice to be made in the order of arrival. Invested capital was to comprise:—

(1.) Stock of every description.

(2.) All implements of husbandry and other articles applicable to the purposes of the productive industry, or necessary for the establishment of the settler on the land where he is to be located.

(3.) The amount of any half-pay or pension received from Government.

Persons who imported labour were also entitled, for the passage of every labouring person imported (amongst whom were included women and children above 10 years of age), to land to the value of £15, that is, to 200 acres, the importers being, however, liable, if necessary, for the future maintenance of the labourers so introduced.

Selection Licenses were granted to settlers on proof of value of property imported, but the fee simple could not be obtained until proof was given that the sum of 1s. 6d. per acre had been expended in the cultivation of the land, or in other solid improvements.

All land granted was to be within three years cultivated, or otherwise improved, or reclaimed from its wild state, to a fair proportion of at least one-fourth, or the owners would be liable to the payment of 6d. per acre into the public chest; and should the land, at the end of seven years, still remain in an unimproved state, it was then to revert absolutely to the Crown.

After the year 1830 fresh conditions were to be made as to the disposal of land.

An agreement was also given that no convicts or prisoners were to be transported to the new Settlement, as was then being done to New South Wales and Van Diemen's Land.

The tempting offer made by the Home Government of grants of land, large and small, in proportion to the amount of property introduced, attracted many holders of capital, the consequence being that extensive tracts of the best land were granted to purely speculative persons.

The first vessels to sail for the Swan River Settlement were H.M.S. "Sulphur," having on board a detachment of the 63rd

Digitized by Google

regiment of Light Infantry, and the hired transport "Parmelia," which carried the emigrants and the principal part of their belongings. Leaving England on the 13th or 14th of February, they arrived in the Colony on the 8th and 2nd June, 1829, respectively.

The following is a List of the Passengers who embarked on board the "Parmelia."

Names.	Designations.	Ages of Children.	Names.	Designations.	Ages of Children.
Capt. Stirling, R.N.	Lt. Govr.		Mr. Jas. Drummond	Agriculturist	
Mrs. Ellen Stirling			Mrs Sarah Drummond		
Andrew Stirling	...	3 years	Thomas Drummond	...	18 years
Wm. Stirling	his Nephew		Jane Drummond	...	16 years
Geo. Mangles			James Drummond	...	15 years
Geo. Eliot	...	11 years	John Drummond	...	13 years
Thos. Blakey			Johnson Drummond	...	9 years
Sarah Blakey			Euphemia Drummond	...	3 years
John Kelly			Elizabeth Gamble		
Elizabeth Kelly			Mr. Chas. Simmons	Surgeon	
James Morgan	...	11 years	Mr. Tully Daly *	Asst. Surgeon	
Mr. P. Brown	Col. Secretary		Mrs. Jane Daly		
Mrs. Caroline Brown			Jessie Jane Daly *	...	8 years
MacBride Brown	...	2 years	Joseph T. Daly	...	6 years
Ann Brown	..	6 months	Hy. Jno. Daly	...	4 years
Richard Evans			Edwd. N. Daly	...	2 years
Margaret McLeod			Eliza Rose Daly	...	2 months
Mary Ann Smith			Jas. Elliott		
Mr. James Morgan	Storekeeper		Alex. Fandam	Cooper	
Mrs. Rebecca Morgan			Mary Fandam		
Rebecca Morgan	...	12 years	Wm. Hoking	Artificer	
Ann Shipsey			Mary Hoking		
Patrick Murphy			Jno. Hoking	...	14 years
Commander M. J. Currie, R.N.	Harbour Master		William Hoking	...	12 years
Mrs. Jane Currie			Mary Hoking	...	10 years
Frederick Ludlow			Thos. Hoking	...	8 years
Mildred Kitts Ludlow			David Hoking	...	6 years
Jane Fruin			Chas. Hoking	...	2 years
Mr. Jno. S. Roe	Surveyor		Thos. Davis	Smith	
Mrs. Matilda Roe			Catherine Davis		
Chas. D. Wright			Jno. Davis	...	3 years
Mr. Hy. C. Sutherland	Asst. Surveyor		Charlotte Davis	...	2 years
Mrs. Ann Sutherland			John Davis	his Nephew	13 years
Mr. W. Shilton	Clerk to Col. Secretary		James C. Smith	Boatbuilder	
			Sarah Smith		

* Drowned in Table Bay (Cape of Good Hope) on 25th April, 1829.

Closely following the "Sulphur" and "Parmelia," a number of vessels arrived, rapidly adding to the little band of settlers, and introducing the live stock necessary for colonisation.

For a list of these vessels, *vide* Year Book 1892-3, page 12, and two subsequent editions.

Up to the 31st December, 1830, there had arrived in the Colony as nearly as can be reckoned, without counting the detachment of troops and their families in the "Sulphur," "Norfolk," and "James Paterson," about 1,767 persons, with stock as follows:—horses 101, cattle 583, sheep 7,981, pigs 66, goats 36, and a variety of poultry, including turkeys, ducks, geese, fowls, and pigeons, and also a few dogs.

Digitized by Google

The value of the property introduced upon which land was claimed between the 1st of September, 1829, and 30th June, 1830, amounted to £73,260 8s. 3½d., equal, at 1s. 6d. per acre, to 976,805 acres of freehold land, whilst miscellaneous property inapplicable to the improvement of land had been imported to the value of £21,021 2s. 7d., making a total value of £94,281 10s. 10½d.

To show how rapidly and prodigally all the best land was taken up, a late arrival wrote, on the 12th November, 1830, just five months after the first settlement of the Colony:—"The only land available for present purposes is on and near the banks of the rivers (viz., the Swan and Canning). All this is now allotted on both sides of each river, almost to their source"; and, writing again on the 8th December, in the same year, he said "All the lands up the Swan and Canning have been long since granted, but some of the grantees have left the Colony, and their lands may be resumed by the Government if not occupied at the expiration of the year."

There being no made roads, and the bush tracks consisting solely of dry, heavy sand, water carriage was the one means of transport for produce, and the only way to obtain land, in an accessible position, suitable for farming purposes, was for the recent arrival to take over a portion of a block already granted, guaranteeing to the owner to perform sufficient location duties on the part taken to secure the whole grant, when the remainder of the property in all probability was left permanently unimproved.

Many of the early arrivals were persons totally unqualified for a settler's life, especially as the pioneers of a new settlement.

Arriving also as they did during the most inclement season of the year, exposed to the elements, and utterly unaccustomed to encounter the hardships and privations incident to their new life, in most cases totally ignorant of agriculture, and unused to poverty and isolation, there is little wonder that the first reports which reached their friends in England were of a gloomy and discouraging description.

Numerous persons, indeed, left the Colony in disgust, but retained possession of the immense tracts of land granted to them; so that those who arrived afterwards were unable to obtain land in favourable localities, and the population was in this way thinly scattered over a wide area, the best of the land being unprofitably locked up.

Gradually, also, it was discovered that the expectations entertained as to the fertility of the soil had been far too sanguine; food became scarce, and pastoral and agricultural operations languished from want of capital to stock and till the lands. Sheep and cattle went blind or dropped dead in a mysterious way, from eating the (at that time unknown) poison plant, and at last it became apparent that the infant settlement could only with great difficulty support itself independently of extraneous aid. On the top of all this came serious troubles with the natives—life was threatened.

Digitized by Google

houses were robbed, crops rooted up, and stock speared; and the abandonment of the Colony was at one time seriously contemplated.

But the settlers as a body struggled manfully on, maintaining (to quote Governor Stirling's despatch to Sir George Murray, G.C.B., the then Secretary of State for the Colonies) "a cheerful confidence in the qualities of the country and a general belief in its future prosperity." For a time the Colony continued to progress steadily, if slowly. Its development was once more, however, retarded by the discovery of the marvellous goldfields of Victoria, and again it seemed probable that it would be entirely deserted. Happily, however, the goldfields of the Eastern Colonies have now ceased to possess the extraordinary fascination they formerly did; and Western Australia, with magnificent goldfields of her own, and numerous other undeveloped resources, offers at the present time to the capitalist, be he large or small, and the industrious and thrifty immigrant, a far better chance of success than those countries where competition is more keen and opportunities are more rare; it being a country where every diligent settler may secure an independence and possess at least the substantial comforts, if not at present all the more refined luxuries, of life.

3.—HISTORICAL EVENTS.

1825.

25th December.—Major Lockyer, with a detachment of the 39th Regiment, and a party of convicts, numbering all told about 75, landed at King George III. Sound, to found the settlement which subsequently became the town of Albany.

1829.

6th February.—The transport "Parmelia," having on board Lieutenant-Governor Stirling and family and intending settlers, numbering in all 69 persons, sailed from Spithead, bound for Western Australia.

9th February. She was joined at Plymouth by H.M.S. "Sulphur," with a detachment of 57 officers and men of the 63rd Regiment on board, under the command of Captain F. C. Irwin.

25th April. Dr. Daly and his eldest daughter, passengers in the "Parmelia," were drowned, through the capsizing of a boat at the Cape of Good Hope. On the same date Capt. C. H. Fremantle, of H.M.S. "Challenger," anchored off Garden Island. He landed at South Head, near the mouth of the Swan River, on 2nd May, and took formal possession in the name of His Majesty King *George IV.*

Digitized by Google

2nd June.—The "Parmelia," which had been sighted from H.M.S. "Challenger" on the previous day, in running into Cockburn Sound, grounded on what is now called Parmelia Bank, off Carnac Island, and was not got off until the next morning. The Governor and settlers first landed and encamped on Garden Island.

8th June.—H.M.S. "Sulphur" anchored in Cockburn Sound, and on the 17th the troops were disembarked.

18th June.—Lieutenant-Governor Stirling issued his first proclamation, establishing His Majesty's authority over the settlement.

12th August.—First stone of the town of Perth publicly laid.

28th August.—The land regulations of the new colony were first proclaimed.

5th September.—F. C. Irwin, J. B. Wittenoom, M. Hodges, G. Leake, and P. P. Smith were assigned allotments within the townsite of Perth; and W. Lamb, J. Hobbs, L. Samson, and T. Bannister were the same day assigned allotments in Fremantle.

29th September.—The first grants for agricultural areas were issued by the Crown Land Department, covering 69,771 acres of land, principally on the Swan River.

17th November.—The first exploring expedition set out from Perth, under the command of Lieut. Preston, accompanied by Mr. Collie.*

25th December.—First white child born in Western Australia (daughter of Lieut. J. S. Roe, Surveyor General, now Mrs. S. P. Phillips).

Between 2nd June and 31st December 18 vessels arrived at the Port of Fremantle. First shipment of sheep was brought to the Colony in the "Caroline," by Mr. T. Henty. Most of these sheep were re-shipped to Tasmania in 1831.

1830.

January.—The "Parmelia" returned to Fremantle from the Dutch East Indies with a cargo of grain, cattle, and pigs.

February.—The "Parmelia" sailed for England.

6th March.—Military station established at Leschenault.

26th April.—First land taken up in the vicinity of King George Sound.

May.—The immigrant ship "Rockingham" wrecked near Rockingham. One life lost.

11th May.—The townsite of Augusta laid out.

Severe storms in May and June. The Swan overflowed its banks, doing considerable damage.

1st November.—The first Executive Council appointed.

November.—First trouble with the aborigines. While attempting to commit a robbery, one black was killed and three

*For particulars of this and later expeditions, *see* chapter on "Exploration in Western Australia."

Digitized by Google

wounded. A short time after, in retaliation, they murdered a man named McKenzie, at the Murray.

Thirty-nine vessels arrived at Fremantle during the year.

1831.

January.—Governor appointed Executive and Legislative Council, consisting of His Excellency the Governor, Captain Irwin, Mr. P. Brown, Lieut. J. S. Roe, and Mr. G. F. Moore.

28th May.—An Agricultural Society organised in Perth.

5th September.—The first body of settlers, under Ensign Dale, crossed the Darling Range and explored the country in the vicinity of the present town of York.

A monthly service of boats established between Guildford and Fremantle.

The first newspaper, the *Fremantle Observer*, issued this year.

Twenty-seven vessels arrived from foreign parts during the year.

One hundred and sixty acres of wheat were reaped this year, and there were 200 acres under cultivation in the Colony, the labour being mostly done by hand.

1832.

January.—The first sitting of the Legislative Council of the Colony.

10th February.—The Civil Court of the Colony established. Mr. G. F. Moore appointed Commissioner.

Thirteen vessels arrived at Fremantle from foreign parts this year.

The first vineyard established in the Colony by Mr. McFaull at Hamilton Hill, near Fremantle. The vines were obtained from the Cape.

1833.

5th January.—The *Perth Gazette and Western Australian Journal* first issued.

2nd October.—First horse race in the Colony, held on the South beach near Fremantle.

Twenty-one vessels arrived at Fremantle from foreign parts this year, bringing 73 passengers.

The townsites of Northam and Toodyay surveyed.

1834.

28th October.—The natives of the Murray District having been very troublesome for some time, a punitive expedition started on the 27th October, under Sir James Stirling, numbering in all 25 men, settlers, mounted police, and soldiers. On the 28th, near Pinjarra, an encounter took place, in which Capt. Ellis was fatally,

Digitized by Google

and one of the troopers slightly wounded, while at least 30 of the blacks were killed.

6th November.—Cattle show held at Perth, under the auspices of the Agricultural Society.

The Legislative Council passed an Act establishing a postal department.

First shipment of wool—7,585lbs.—to England.

1835.

January.—Mr. C. McFaull appointed first postmaster at Perth, and M. J. Bateman at Fremantle.

Owing to the scarcity of a circulating medium, the Government decided to issue one-pound notes from the Commissariat Office.

July.—The first town allotments in York sold to Messrs. Bland and Trimmer.

This year is notable for an assessment of the value of land and the improvements in the Colony, with the number of live stock. The amount represented nearly a quarter of a million sterling. About 1,800 acres of land were under crop, and fifty bales of wool were sent to London.

1836.

May.—The first sea-going craft built in the Colony, "The Lady Stirling," was launched at Fremantle.

First shipment of W.A. timber to England.

A court house erected in Perth, at a cost of £700.

Contracts accepted by the Imperial Commissariat Department for the delivery at Perth of 1,200 bushels of wheat, at 12s. per bushel.

1837.

Early in the year the price of allotments in Perth, Fremantle, and Albany was fixed by the Lands Department at a minimum of £5 per acre.

Busselton surveyed and first lot sold to Mr. Chapman.

1st June.—The Bank of Western Australia commenced business.

10th June.—The Fremantle Whaling Company began operations by the capture of a whale in Cockburn Sound.

Natives very troublesome at York, Beverley, and Northam. They murdered four white men and stole cattle and sheep from settlers throughout the valley.

In March direct communication between Perth and King George Sound was opened by road.

1838.

A temperance society and "The Sons of Australia" Benefit Society were established at Perth.—In June the Western Australian Bank declared its first dividend.

Digitized by Google

The Fitzroy and Adelaide Rivers (Kimberley District) discovered by H.M.S. "Beagle."

1839.

2nd January.—Governor Hutt arrived at Fremantle.

1840.

January.—The ship "Shepherd" sailed for London, laden wholly with colonial produce.

August.—The *Inquirer* newspaper first issued in Perth.

2nd November.—The first pile driven of the old Perth Causeway.

Grammar school opened in Perth.

Foundation-stone of a Wesleyan chapel was laid at Fremantle by Governor Hutt.

1841.

1st January.—Foundation-stone of Anglican Church in Perth laid by Governor Hutt.

February.—The Townsite of Bunbury surveyed.

May.—The Bank of Western Australia bought out by the Bank of Australasia.

23rd June.—The new Western Australian Bank commenced business in Perth.—A weekly mail between Guildford and York, and an overland monthly to King George Sound, established.

1842.

1st January.—Wesleyan Church opened in Perth.

21st January.—Foundation-stone of a lighthouse at Rottnest laid by Mr. H. Trigg, Superintendent of Public Works.

6th April.—Regular mail service between settlements of the Colony inaugurated.

Foundation-stone of an Anglican church at Fremantle laid by the Governor.

The "Diadem" arrived at Koombanah Bay, with 170 passengers for the Australind Settlement.

The Mill Street jetty opened to the public.—A "Western Australian Society" established.

1843.

22nd March.—The "Success" arrived, carrying 134 immigrants, and having on board Mr. G. F. Moore, Advocate General of the Colony.

27th March.—Proclamation of "An Act for regulating the sale of waste land belonging to the Crown."

May.—The Perth "Causeway" completed.

Digitized by Google

1844.

June.—First shipment to India of horses bred in the Colony.

1845.

22nd January.—St. George's Church (Perth) opened for public worship.

December.—The first steam vessel, H.M.S. "Driver," visited Fremantle.

First shipment of sandalwood from the Colony.

1846.

July.—Reported discovery of coal at the Murray River.

September.—The first mining company organised in the Colony, viz. :—"The Western Australian Mining Company," to prospect for coal.—The New Norcia Mission established.

First Congregational Church opened in Perth.

1847.

July and August.—Heavy rains and floods, causing great damage to gardens and growing grain on the Swan, Avon, and other rivers in the South-Western Districts.

September.—Regulations for the leasing of Crown lands issued.

First export of guano from the Abrolhos.

1848.

September to November.—Copper and lead discovered in the Champion Bay District by the Messrs. Gregory.

December.—Governor Fitzgerald speared and wounded by blacks at Northampton.

1849.

Natives employed as letter carriers through the country districts.

Efforts were made to remove the bar at the mouth of the Swan River.

1850.

1st June.—The "Scindian" arrived at Fremantle from England with convicts; a guard of 50 pensioners and 138 women and children on board.

June —First town lots sold at Geraldton.—Minimum price of Perth city lots fixed by the Lands Department at £22 each in St. George's Terrace, Adelaide Terrace, and Waterside; £17 in Hay Street; back streets, £12.

Lieut. Helpman, while exploring on the Saturday Island Shoal, in Shark Bay, found pearl oysters, from which he obtained several fine pearls.

Digitized by Google

1851.

January.—A report on the existence of pearl oysters in Shark Bay, by Lieut. Helpman, of H.M.C. schooner "Champion," published in the Perth newspapers.—Formation of the Swan River Mechanics' Institute in Perth.

1st February.—The "Champion" returned from her cruise in Shark Bay and Champion Bay.

13th March.—Proclamation in W.A. of Imperial Act empowering the Colony to establish a Legislative Council.

15th August.—A Mechanics' Institute founded at Fremantle.

October.—Discovery of copper on the Geraldine mine.

1852.

25th May.—The foundation-stone of the Swan River Mechanics' Institute laid by Governor Fitzgerald.

July.—The Royal Mail S.N. Company's s.s. "Australian" landed the first mail at Albany. It took two horses six and a-half days to carry the mail to Perth.

August.—The "Chusan," the first P. & O. steamer to visit Australian waters, arrived from Singapore.

Smelting furnace erected at the Geraldine Mine.

Colonial wine exported for the first time this year.

1853.

11th May.—Chamber of Commerce organised in Perth.

Fifty-five tons of pig-lead exported by the Geraldine Mining Company.

1854.

The first postage stamps issued—the black penny stamp.

1855.

March.—The steamer "Les Trois Amis" commenced running on the Swan, from Fremantle to Perth.

22nd June.—Post Office Savings Bank opened.

Grand juries abolished.

1856.

July.—The first Anglican Bishop of Perth, Matthew Blagden Hale, M.A., arrived in the Colony,

October.—Contract entered into between the Home Government and the P. & O. Company for direct service with the Australasian colonies, calling at Albany.

Perth constituted a city.

Digitized by Google

1857.

Insolvency Act came into force.

January.—The "Pioneer," a steamer built of local timber, commenced to make trips to Guildford.

February.—The steamer "Lady Stirling" launched at Fremantle.

1858.

28th June.—The Bishop's School opened in Perth.

1859.

17th March.—Foundation-stone of Government House laid.

Imperial Government memorialised to assist in the construction of a railway from Champion Bay to the lead and copper mines at Northampton.

1860.

24th May.—Formation of a Western Australian Association in Perth

August.—Townsite of Newcastle marked out.—Completion of a Museum connected with the Swan River Mechanics' Institute.

1861.

Ordinance passed by the Legislative Council for the organisation of a Volunteer Defence Force.

1862.

February.—Money order office opened in connection with the Post Office Department.

June and July.—Great floods in various parts of the Colony. The Mount's Bay Road was 2ft. under water, the low lands and gardens along the Swan were submerged, and the jetties completely covered with water. At York, buildings were carried away. At Toodyay, Northam, Bunbury, Geraldton, and Fremantle the floods did an immense amount of damage. The loss to public and private property estimated at £30,000. Several lives were lost, among them Lieut. Oliver, while attempting to cross the bridge at the Perth Causeway.

A small consignment of cotton, grown in the Victoria District, sent to England.

Pearl shells exported to the value of £250.

First export of flour from the Colony.

1863.

April and May.—First settlement of the North-West District by Messrs. Padbury, Wellard, Withnell, and others.

September.—*Post Office Savings Bank* established.

Digitized by Google

17th October.—The Perth Benefit Building Investment and Loan Society organised.

The Roman Catholic Cathedral in Perth completed.

1864.

Perth divided into three wards for municipal purposes.

23rd July.—The Roebuck Bay Pastoral and Agricultural Association, Limited, formed.

August.—The first shipment of wool from the Nor'-West (seven bales) arrived at Fremantle.

September.—Trinity Congregational Church opened for public worship.

9th November.—Messrs. Panton, Harding, and Goldwyer, who were among the first to sail for Roebuck Bay, while exploring the country towards La Grange Bay, were killed by the aborigines. The bodies were subsequently found by a party under the leadership of Mr. Maitland Brown, who, while returning to the coast, were attacked by a large body of natives. On the 17th May, 1865, the bodies were accorded a public funeral; the grave, in the old cemetery in East Perth, being marked by an imposing obelisk bearing a suitable inscription.

Towards the end of the year vessels sent out by the Camden Harbour Pastoral Association, organised in Melbourne, under the leadership of Mr. C. E. Broadhurst, left Victoria with settlers and stock for the newly-discovered pasture lands in the vicinity of Roebuck Bay and other localities on the Northern coast of the Colony,

1865.

2nd May.—The "Warrior" called at Fremantle from Melbourne with settlers and stock for the Denison Plains Association.

Diphtheria makes its first appearance in the Colony.

1866.

The town of Roebourne proclaimed. Mr. R. J. Sholl appointed Government Resident.

At the end of the year 49 runs were held under lease, with an aggregate of 4,720,000 acres.

1867.

3rd March.—The schooner "Emma" left Nickol Bay for Fremantle, with 42 persons on board, and was never heard of after leaving port.

19th March.—The cutter "Brothers" foundered and was lost, with six persons on board. The "Lass of Geraldton," bound from Fremantle to Bunbury, capsized in a squall, and seven lives were lost, Mr. G. Shenton being one of the number.

24th May.—Corner-stone of Perth Town Hall laid by Governor Hampton.

Digitized by Google

24th October.—Foundation-stone of the new Perth Wesleyan Church laid by Governor Hampton.

1868.

10th January.—The "Hougomont"—the last convict ship—arrived at Fremantle.

February.—The wheat crop in the Victoria District—13,895 acres—owing to the rust, proved an almost total failure.

June.—Captain J. Harding, harbour master at Fremantle, and four of his crew were drowned by the capsizing of his boat.

13,000 bushels of wheat and 1,163 tons of flour exported this year.

1869.

1st January.—A waterspout formed in the river opposite Government House, doing much damage to the gardens on the banks.

3rd February.—H.M.S. "Galatea," having on board H.R.H. the Duke of Edinburgh, arrived at Fremantle.

9th February.—The first telegraph post fixed opposite the General Post Office, Perth, by the Colonial Secretary, Mr. F. P. Barlee.

21st June.—The first telegraph line in the Colony, from Perth to Fremantle, formally opened. The work was done by private enterprise. Ultimately the line was acquired by the Government.

1870.

8th April.—The new Wesleyan Church, Perth, opened for Divine service.

30th May.—The Perth Town Hall formally opened.

May.—The Legislative Council authorised the construction of telegraph lines from Perth to Albany, Bunbury, York, and Newcastle.—Severe drought in the Northern and Eastern districts; great losses of sheep, cattle, and horses.

5th December.—The first Legislative Council under Representative Government met.

25th December.—Hurricane in Nickol Bay; three pearling boats driven ashore and two lives lost.

1871.

January.—The Municipal Institutions Act passed, giving local government to Perth, Fremantle, and other towns.

The first posts of the Eastern District telegraph line placed by Governor Weld at Perth on the 13th of February, at York on the 14th of March, and at Northam on the 18th of March.

August.—The Weld Club founded.

23rd December.—Telegraphic communication opened with Guildford.—*The Western Australian Timber* Company opened the

Digitized by Google

first railway line in the Colony, from the Vasse to Lockeville (12 miles in length). The first Loan Bill, £100,000, was passed by the Legislative Council, for the purchase of telegraph lines, railway surveys, and other public works, but the amount was reduced by the Colonial Secretary, Earl Kimberley, to £35,000.

December.—Engineers were engaged to survey a railway line from Geraldton to Northampton.—Elementary Education Act passed.

1872.

3rd January.—Telegraph line opened for business at Newcastle.

8th February.—The Canning private tramway—nine miles in length opened.

February.—Victoria District visited by a hurricane, rains and floods, doing great damage; carrying away houses, fences, destroying crops, etc., to the extent of thousands of pounds sterling.

10th March.—Arrival in Perth of Anthony Trollope, the celebrated novelist.

20th March.—Cyclone at Roebourne. Within half-an-hour all the buildings in the town levelled to the ground. Many persons injured. At the Nickol River about 5,000 sheep were lost in the flood and many buildings were blown down. Several pearling boats driven ashore; one, the "Nellie," with two men on board, disappeared.

June and July.—Continuous rain for the period of six weeks throughout the Avon and Swan Valleys. On the 22nd July the Swan rose even higher than during the flood of 1862. Great injury done to bridges, jetties, gardens, etc., along the Avon and Swan Rivers. At Gingin an old settler was drowned.

26th December.—The telegraph line opened at Albany.

1873.

September.—Very heavy gale at Fremantle.

1874.

January.—The membership of the Legislative Council increased from 18 to 21; seven nominated by the Governor.

18th May.—Telegraph line opened to Geraldton, *viâ* Newcastle.

The question of Responsible Government was agitated and brought before the Legislative Council, but the Home Government intervening "prudent delays," the subject dropped.

22nd October.—First sod turned of the Geraldton-Northampton railway by Governor Weld.

1875.

1st January.—The first telegraph post of the Busin line erected at Albany by Governor Weld.

Digitized by Google

July.—A Bill passed the Legislative Council inaugurating the "Torrens'" system of land transfers.

1876.

1st January.—Violent gale at Exmouth Gulf; a number of pearling vessels wrecked and 69 lives lost.

18th April.—Six Fenian prisoners escaped from the Fremantle prison, and were picked up off Rockingham by the American whaler "Catalpa."

1877.

February.—Six vessels loading guano at the Lacepede Islands wrecked in a hurricane; six lives lost.

7th December.—Telegraph line opened to Beverley.

8th December.—Eucla telegraph line completed.

9th December.—Telegraph communication opened with South Australia.

1878.

5th April.—Telegraph line opened at Northampton.

1879.

3rd June.—The 50th anniversary of the foundation of the Colony celebrated in Perth and other principal towns of Western Australia. First sod of the Eastern Railway turned by Governor Sir Harry Ord, at a spot adjacent to the William Street crossing.

26th July.—The Geraldton-Northampton Railway opened for traffic.

26th November.—Mr. Alex. Forrest and exploring party returned to Perth from an expedition in the Kimberley District.

1880.

2nd November.—The foundation-stone of the new St. George's Cathedral laid by Governor Sir Wm. Robinson.

Mr. S. H. Parker elected the first Mayor of Perth, *vice* Mr. G. Shenton, the last chairman of the Perth Council.

1881.

January.—Another cyclone on the coast, near Roebourne, wrecked a number of pearling vessels, and several lives were lost. A cyclone on the Ashburton wrecked buildings and fences, destroying over 1,000 sheep. A tidal wave which accompanied the cyclone swept completely over the Twin Islets, situated off the coast near Direction Island.

1st March.—The Fremantle-Guildford Railway (the first section of the Eastern line) formally opened by Governor Robinson.

1st April.—First *mail train on the Eastern* line.

Digitized by Google

16th May.—Arrival of their Royal Highnesses, Prince Albert Victor and Prince George of Wales, in Albany, in H.M.S. "Bacchante," which put in after suffering a very stormy passage round Cape Leeuwin. The vessel left on June 10. Their Royal Highnesses were hospitably and pleasantly entertained at Albany, but were unable to visit Perth.

December.—Contract let for the construction of the second section of the Eastern Railway, from Guildford to Chidlow's Well.

1882.

The membership of the Legislative Council increased from 21 to 24.

The Kimberley District first settled by pastoralists.

March.—Mr. A. McRae found a nugget of gold weighing 14dwts. while riding from Roebourne to Cossack.

April.—A hurricane at Cossack and Roebourne destroyed many buildings. Hundreds of sheep were drowned on the stations by the floods which followed.

1883.

September.—The Legislative Council voted £2,000 towards the erection of Fremantle Town Hall.

Fremantle elected its first Mayor.

Between the months of November, 1883, and March, 1884, a very serious epidemical outbreak of measles took place, 95 deaths (48 males and 47 females) occurring from this cause.

1884.

11th March.—The Eastern Railway opened to Chidlow's Well.

22nd October.—Contract let for construction of the York section of the Eastern Railway.

25th October.—Contract for the construction of the Albany-Beverley Railway, on the land-grant system, let to Mr. Anthony Hordern, of Sydney.

1885.

21st April.—Contract let for construction of railway from York to Beverley.

29th June.—Eastern Railway formally opened to York.

5th August.—First service held in the (new) St. George's Cathedral.

First gold found by prospectors on the Margaret and Ord Rivers, in the Kimberley district, by Hall, Slattery, and party.

1st October.—Telegraph line from Geraldton to Roebourne opened.

17th November.—Telegraph line from Roebourne to Cossack opened.

Digitized by Google

1886.

February.—First meeting of Federal Council at Hobart. Contract signed for construction of the Midland Railway from Midland Junction to Walkaway. The first sod of the Geraldton-Greenough Railway turned by Governor Broome.

20th May.—Kimberley Goldfield proclaimed.

5th August.—Railway formally opened between York and Beverley by Governor Broome.

13th October.—The Northam Railway opened for traffic.

20th October.—First sod on the Albany-Beverley Railway turned.

First Goldfields Act passed.

1887.

22nd April.—A cyclone off the Ninety-mile Beach—about 180 miles from Cossack—destroyed nearly the entire pearling fleet, with a loss of over 200 lives.

21st June.—The 50th anniversary of the Queen's reign celebrated in Perth and the other principal towns of Western Australia. The Geraldton-Greenough Railway opened.

22nd June.—The Fremantle Town Hall opened.

30th November.—Cossack and Roebourne declared municipalities.

1st December.—The Telephone Exchange system inaugurated at Perth.

Gold quartz found by Mr. H. Anstey, at Eenuin, in the Yilgarn District, and in Golden Valley, in the same district, by Mr. Colreavy. —Southern Cross gold reefs discovered by Mr. Tom Riseley, while prospecting for the Phœnix Company.

1888.

1st January.—A telephone branch opened at Fremantle.

3rd January.—The Clackline-Newcastle Railway opened.—The Roebourne-Cossack Tramway built.

February.—Flood in the Greenough District. Several lives lost sheep and cattle swept away, houses and a portion of the telegraph and railway line destroyed.

1889.

February.—Telegraph cable from Banjoewangie, Java, to Broome opened for business.

26th February.—Constitution Bill, in connection with Responsible Government, passed the Legislative Council.

May.—Perth Water Supply Works commenced.

1st June.—The Albany-Beverley Railway opened for traffic. The telegraph line to Derby opened.

Digitized by Google

1890.

February.—Federation Conference met at Melbourne.

July.—The Enabling Bill, empowering the Queen to give assent to the Constitution Bill passed by the Legislative Council of Western Australia, passed the third reading in the House of Commons.

15th August.—Royal assent given to the constitution of the Colony of Western Australia.

20th October.—Sir William Robinson—for the third time Governor of the Colony--arrived in Perth.

21st October.—The New Constitution proclaimed by Sir William Robinson.

October.—Perth Waterworks completed by the Perth Water Supply Company.

November.—Members of the Legislative Assembly, the first under Responsible Government, elected.

18th November.—The Albany-Denmark Railway completed.

24th December.—The Governor, Sir William Robinson, nominated the members of the Legislative Council under the new constitution, and called upon Mr. J. Forrest to form the first Ministry of Western Australia.

29th December.—The Forrest Government assumed office.

30th December.—The two Houses of Parliament sworn in. Sir T. Cockburn Campbell, Bart., appointed President of the Legislative Council, and Sir J. G. Lee Steere elected Speaker of the Legislative Assembly.

1891.

20th January.—First Parliament under Responsible Government opened by Governor Sir William Robinson.

February.—The Bunbury Railway Bill passed.

2nd March.—The first Federal Convention met at Sydney.

9th April.—The Midland Railway declared open as far as Gingin.

Murchison Goldfield discovered by Connolly and Douglass.

1892.

February.—Telegraph line opened to Southern Cross.—Sir Malcolm Fraser appointed Agent General.

March.—Mr. A. P. Hensman appointed a Judge—The Yilgarn Railway Bill passed.

August.—Rich discovery of gold made by Messrs. Bayley and Ford on the spot where the town of Coolgardie now stands.

7th September.—Contract let for the construction of the railway to Southern Cross.

Digitized by Google

September.—Owing to the death of Sir T. Cockburn Campbell, Mr. G. Shenton appointed President of the Legislative Council. —Mineral Lands Act passed.

16th November.—Operations commenced on the Fremantle Harbour Works, Lady Robinson tipping the first load.

1893.

January.—Telegraph line opened to Wyndham, 2,125 miles from Perth.

19th March. — Contract let for the construction of the Geraldton-Mullewa Railway.

April and May.—An outbreak of small-pox took place, 46 cases (31 males and 15 females) occurring in Perth. Seven deaths occurred (5 males, and 2 females). One case also occurred at Albany, and one fatal case at Fremantle.

8th September.—Railway from Perth to Bunbury formally opened by Governor Sir William Robinson.

13th October.—Constitution Act Amendment Act assented to.

16th November.—The railway from Boyanup to Minninup opened.

Federation Council met at Hobart.

The Homesteads Act passed.

By Act of Parliament, educational affairs placed under the control of a responsible Minister of the Government.

1894.

10th March.—Arrival at Albany of Sir Henry Parkes, G.C.M.G., on a visit to Western Australia. He left again on the 30th March.

25th March.—New Railway Station at Perth completed.

Second parliamentary elections held: Legislative Assembly in June, Legislative Council in July.

1st July.—The Southern Cross Railway opened for traffic.

21st November.—The Geraldton-Mullewa Railway completed.

November.—The Midland Railway completed. Telegraph line completed to Cue and Nannine.

Telegraphic communication opened between Southern Cross, Coolgardie, and Kalgoorlie.

Agricultural Bank Act passed.

1895.

January.—Federation Conference met at Hobart.

18th June.—Contract let for the construction of the railway from Southern Cross to Coolgardie.

Digitized by Google

November.—The Goldfields Act passed.—Act passed authorising the construction of a Royal Mint.

December.—Act passed abolishing State aid to denominational schools.

26th December.—Railway from Boyanup to Busselton opened for traffic.

31st December.—Contract let for the construction of the railway from Mullewa to Cue.

1896.

23rd March.—Railway to Coolgardie formally opened by Governor Sir Gerard Smith.

March.—A Western Australian Society of Arts formed.

1st July.—Mahogany Creek deviation on the Eastern Railway opened.

8th September.—Railway from Coolgardie to Kalgoorlie opened.

23rd September.—Foundation-stone of the Perth Branch of the Royal Mint laid by Sir John Forrest.

September.—An Act passed authorising the construction of the Mundaring Weir and other works for supplying Coolgardie with water. Contract for the construction of the Collie Railway let. Telegraphic communication opened with Kurnalpi, Mt. Magnet, Yalgoo, Dundas, Mallina, and Pilbara.

8th October.—Constitution Act Amendment Act assented to.

1st December.—Contract let for construction of the Donnybrook-Bridgetown Railway.

December.—The Great Southern Railway from Albany to Beverley purchased by the Government.

1897.

8th January.—The Great Southern Railway formally taken over by the Government.

11th January.—First Exhibition of the W.A. Society of Arts opened by the Premier.

22nd March.—Federal Convention met at Adelaide.

27th April.—The Premier (Sir John Forrest) tipped the first load of stone for the Bunbury Breakwater.

4th May.—The steamer "Sultan," W.A.S.N. Co., 1270 tons register (2062 gross), steamed into the new harbour at Fremantle and discharged at the wharf.

21st June.—The 60th anniversary of Queen Victoria's reign celebrated in Perth and the other principal towns of Western Australia.

28th June.—Duplication of Eastern Railway from Fremantle to Guildford completed.

Digitized by Google

Third Parliamentary elections held in June and July.

12th August.—Cold Storage Depôt opened to the public.

17th August—Contract let for the construction of the railway to Menzies.

17th August.—Contract let for the construction of the Greenhills Railway. Third Parliament met for the first time.

28th August.—Telegraph line opened at Lawlers.

1st September.—Perth Market opened.

24th September.—Second session of Federal Convention met at Sydney.

8th October.—The s.s. "Cornwall," 3,554 tons register (5,500 gross), drawing 19 feet, and with a keel length of 420 feet, berthed at the South Quay.

23rd December.—The Mining on Private Property Act became a law.

1898.

January.—A difference between the alluvial miners at Kalgoorlie and the Manager of the Ivanhoe Venture Gold Mine led to serious disturbances, the unrest extending to other places on the goldfields. The Goldfields Act of 1895, under Section 36, gave the alluvial miners the right to search for alluvial gold on leases, with certain restrictions. The principal question in dispute was whether there was a reef on the lease of the Ivanhoe Venture Syndicate or not. The leaseholders considered it a great hardship that the Act confirmed the existence of dual titles, those of the leaseholders and those of the claimholders. The alluvial miners, on the other hand, held that they had a moral and legal right to the alluvial gold, at whatever depth it was found. Before a decision on the case was given in the Warden's Court, the Government passed a regulation limiting the depth to which alluvial could be worked to 10 feet. The diggers were much incensed at this regulation, which they called "the ten-feet drop." As regards the question of the reef, the Government Geologist reported that there was as yet no proof of its existence. The Warden's decision in the case went against the alluvial miners. The latter, however, paid no heed to this decision, and continued to enter on the lease. Relations between the syndicate and the miners then became so strained that several of the latter were eventually imprisoned. On the 24th March, Sir John Forrest visited Kalgoorlie to meet the delegates of the alluvial miners, and hear their grievances; but on his declining to address the crowd which had gathered outside the hotel where the conference took place, some of the more excitable spirits became unruly, and on his way to the station the Premier was somewhat roughly hustled, fortunately without any serious results. After much further friction, the Ivanhoe Venture Syndicate agreed to take a test case into the Supreme Court. The trial took place in August, and the decision of the Court was in favour of the alluvial miners. *Petitions were then forwarded to the Government by*

Digitized by Google

various mining companies, asking for the abolition of the dual title. In consequence of this a Royal Parliamentary Commission was appointed, which came to the conclusion that the dual title undoubtedly inflicted a great hardship on the leaseholder. The new Mining Act (62 Vict., No. 16) was consequently passed, Sections 10 and 11 of which define the relations between leaseholders and claimholders in a manner calculated to avoid a conflict between their respective interests.

20th January.—Third session of the Federal Convention met at Melbourne.

1st February.—The Boulder Railway completed.

23rd February.—The first mail steamer, "The Prinz Regent Luitpold," belonging to the Norddeutscher-Lloyd Company, called at Fremantle, and was berthed in the new harbour.

22nd March.—The railway to Menzies formally opened by the Governor.

28th April.—Sir Malcolm Fraser resigned the Agent Generalship, and the Hon. E. H. Wittenoom was appointed in his stead.

15th June.—The Kanowna Branch Railway completed.

17th June.—The Fremantle markets opened.

30th June.—Mullewa-Cue Railway and Collie Coalfields Railway completed.

July.—A Bill providing for Free Education introduced in the Legislative Assembly.—Favourable reports received from Prof. McCoy, of the Melbourne University, testifying to the great commercial value of Collie coal.—Tenders called for the erection of a butter factory at Busselton.

6th July.—A motion adopted by the Legislative Assembly for the appointment of a Royal Commission to inquire into the penal system of the Colony.

8th July.—Royal Proclamation published establishing a branch of the Royal Mint in Perth.

1st September. — The Greenhills-York Railway formally opened.

19th September.—Sir George Grey died in England, at the age of 86. Sir George Grey was exploring in this Colony during 1837 and 1839.

1st October.—The new waterworks at Fremantle completed.

4th October.—The third reading of the Goldfields Water Supply Bill passed the Legislative Assembly.

10th October.—Telegraph office opened at Peak Hill.

17th October.—The Zoological Gardens at South Perth formally opened by the Governor, Sir Gerard Smith.

20th October.—The amended Mining on Private Property Bill *passed in* the Legislative Council.

Digitized by Google

30th October.—The N.D.L. Co's. s.s. "Friedrich der Grosse," 10,500 tons, drawing 23 feet of water, berthed at the South Quay.

1st November.—The Government service of trains on the Donnybrook-Bridgetown extension of the South-Western Railway commenced.

25th November.—The first butter factory in the Colony started at Busselton.

1st December.—The Bridgetown Railway formally opened.

16th December.—A public meeting held in Perth, at which it was resolved to inaugurate an institution for the treatment and comfort of incurables.

17th December.—The foundation-stone of the Victoria Institute and Industrial School for the Blind at Maylands laid by the Governor, Sir Gerard Smith.

Funds amounting to £2,700 were subscribed towards the establishment of a Children's Hospital in Perth.—A Labour Bureau, initiated by the Government, was opened in Perth.—Valuable presents of red and fallow deer were made by Her Majesty the Queen to the recently-established Zoological Gardens at South Perth.—The Government accepted tenders for the supply of pipes for the Coolgardie Water Scheme.—Diamonds were reported to have been found at Nullagine, in the North-West district.—The Government accepted a tender to lease the Wallsend coal mine at the Collie.—Reports were received from Eucla of serious inroads by rabbits in that neighbourhood.—A large number of German settlers from South Australia took up selections at Katanning and other localities on the Great Southern Railway.—Several of the male inmates of the Fremantle Lunatic Asylum were transferred to the new asylum at Whitby Falls.

1899.

13th January.—At a meeting of the Fremantle Municipal Council a resolution was passed to invite offers for a combined scheme of electric light and tramways.

17th January.—The Premier (Sir John Forrest) and other delegates to the Federal Council left Albany for Melbourne.

20th January.—The Perth Tramway scheme was formally approved by the City Council. The first sod of the Hay Street line was turned by Miss Forrest, daughter of the Mayor, on 30th January.

24th January.—The first session of the Federal Council opened in Melbourne.

29th January.—First Hospital Sunday in Perth.

21st February.—"General" Booth of the Salvation Army, visited the Colony.

March.—The Penal Commission made their final progress report to the Government.—*A new ballroom* and several other *important additions to Government House* were completed.

Digitized by Google

21st March.—The Coolgardie Exhibition was opened by the Governor.

4th April.—The first annual conference of the State School Teachers' Association of Western Australia held.

11th April.—The first Trades Union Congress in Western Australia held at Coolgardie.

19th April.—The Queen's Hall, Perth, opened by the Hon. Sir John Forrest.

April.—Rich discoveries of tin made in the Pilbara district.

5th May.—Destructive fire at Coolgardie, involving the loss of buildings and other property to the value of over £3,000.

16th May.—A public meeting held in the Perth Town Hall passed a resolution sympathising with the *Uitlanders* in the Transvaal in their political grievances, and authorised the transmission of this resolution to the Secretary of State for the Colonies.

19th May.—A Chamber of Manufacturers for Western Australia formed, in pursuance of a resolution passed at a meeting of manufacturers and others held in Perth.

14th June.—H.M.S. "Royal Arthur," Rear-Admiral H. L. Pearson, arrived at Fremantle from Sydney, proceeding to a berth at the quay in the river. -The Penal Commission presented its final report.—The Paris Exhibition Commission appointed.

21st June.—Sir Gerard Smith, K.C.M.G., the Governor of the Colony, performed the ceremony of declaring the Perth branch of the Royal Mint opened.

June.—Captain Angus, deputed by the P. & O. Company to report on the newly-constructed harbour basin at Fremantle, arrived from England. Subsequently Captain Angus reported favourably on the facilities for the accommodation of deep-sea steamships afforded by the new harbour basin.—An experimental nursery farm was successfully established by the Forests Department at Drakesbrook, on the South-Western Railway.

12th July.—Snowstorms in various parts of the Colony reported. At Mount Barker several inches were recorded.—The barques "City of York" and "Carlisle Castle," from San Francisco and Glasgow respectively, were wrecked near Fremantle, the former vessel on the West side of Rottnest Island, the latter on Coventry Reef, lying a few miles Southward of Garden Island. The "City of York" carried a crew of 25 all told; of these Captain Jones and 11 others perished. The crew of the "Carlisle Castle" numbered 22 persons, all of whom were drowned.

17th August.—The Legislative Council, by eight votes to six, declared in favour of extending the franchise to women.

8th September.—The "Braeside" station, in the Pilbara district, raided by wild natives. Dr. Vines killed, and several others *wounded.*

Digitized by Google

24th September.—Electric cars ran for the first time on the Hay Street tram line.

4th October.—The first West Australian Manufacturers' Industrial Exhibition in Perth opened by Lady Smith.

9th October.—Foundation-stone of Sailors' Rest, Fremantle, laid by Sir John Forrest.—Queen's Gardens at East Perth opened by the Mayor.

11th October.—The first annual conference of the West Australian Chamber of Manufacturers held in Perth.

25th October.—A shock of earthquake experienced at Wyndham.

October.—Satisfactory reports were received from England of various tests made with Collie coal.—The Public Education Bill, providing for compulsory and free education in the State schools, came into force.

1st November.—First annual show of the Amateur Horticultural Society of Western Australia opened in Perth by Sir A. C. Onslow, Kt.

2nd November.—Foundation-stone of the Deaf and Dumb Institution, at Cottesloe Beach, laid with Masonic rites by the Governor, Sir Gerard Smith.

4th November.—The Government having decided, in October, to organise and equip a corps of infantry volunteers, 120 strong, to proceed to Cape Colony and co-operate with the Imperial troops in subduing the Boers, the corps proceeded from Perth to Albany by railway on this date, and embarked by the s.s. "Medic," on the 7th November. The command of the company was entrusted to Captain H. G. Moor, R.A., of the Albany forts, with the rank of Major. Dr. G. F. McWilliams took medical charge, with the rank of Major. The other commissioned officers were Lieuts. H. F. Darling and F. Parker, and Second-Lieutenant J. Campbell. On board the "Medic" were also contingents from Victoria, South Australia, and Tasmania. Immediately following the departure of the s.s. "Medic," Sir John Forrest received telegrams from the Premiers in the Eastern Colonies regarding the proposal to supply a second contingent for service in South Africa.

December.—An official return showed that the valuation of the city of Perth for the year was as follows:—Capital value, £3,702,810; annual value, £290,275.—News received of the murder of Captain Reddell and portion of the crew of the brigantine "Ethel," off Roebuck Bay, on the 19th October.—Highly satisfactory reports on samples of Western Australian wheat received by the Secretary for Agriculture from American experts at the Philadelphia Commercial Museum.—The Imperial authorities accepted the offer to send twenty trained nurses from this Colony to South Africa free of cost to the British Government.—Arrangements were entered upon for despatching to the Cape Colony a second contingent of troops (mounted infantry), to co-operate with the British forces in South Africa. The strength of the corps was limited to 130 officers

Digitized by Google

and men. Major H. L. Pilkington, formerly Captain 21st Hussars, was placed in charge. The other commissioned officers were Captain R. T. McMaster, Lieut. S. Harris, Lieut. S. Inglis, Lieut. J. De Castilla; and Captain J. M. Y. Stewart, M.O.

1900.

3rd January.—At a conference held at Kalgoorlie in connection with the "Separation" movement—*i.e.*, the agitation for creating the Goldfields districts a separate province—a manifesto setting forth the grounds on which such separation was held to be desirable and justified was formulated and agreed to.

6th January.—The extension of the electric tramway system to Subiaco completed.

24th January.—The steam yacht "Sunbeam," with Lord Brassey on board, bound for England, called at Fremantle. The "Sunbeam" resumed her voyage, *via* Java, on the 26th January, when Lady Brassey rejoined the ship's party, having landed at Albany and journeyed to Perth by train.—Premiers' conference in Sydney on Federal and other questions.

January.—A strike among the drivers and firemen on the railways of the Colony, consequent on the dismissal of the Loco. Superintendent (Mr. R. B. Campbell) caused serious delays and inconvenience for several days.—Strict precautions taken at the various seaports of the Colony to guard against the introduction of bubonic plague.—The dignity of K.C.M.G. was conferred upon the Hon. Sir J. G. Lee Steere, Speaker of the Legislative Assembly.

2nd February.— The arrival of the transport "Surrey" at Fremantle, for the purpose of conveying the Second Contingent to South Africa, was marked by a great patriotic demonstration.

6th February. —The submarine cable connecting Rottnest with the mainland laid.

9th February.—First casualty among the West Australian troops in South Africa, at Slingersfontein.

18th February.—Mr. S. H. Parker, Q.C., specially engaged by the Government to represent the Colony in London during the passage of the Commonwealth Bill through the Imperial Parliament, left for England in the R.M.S. "Himalaya."

20th February.—First annual session of the Grand Lodge of the Independent Order of Oddfellows of Western Australia opened at Coolgardie.

26th February.—Conference of Government Statisticians respecting matters in connection with the Census of 1901, held in Sydney, Mr. Malcolm A. C. Fraser, Registrar General, representing Western Australia.

February.—The Minister for Lands decided to make regular shipments of fresh fruit, to the Agent General in London, during he fruit season.—The Government decided upon organising a third

Digitized by Google

Contingent, 100 strong, to be distinguished as the "Bushmen's Corps," for service in South Africa; Major H. G. Vialls (late Capt. R.O.'s, West Yorkshire Regiment), was entrusted with the command; the other commissioned officers were Capt. H. E. Hurst, Lieuts. C. H. Ord, A. F. Thunder, R. R. C. Vernon, and M. R. P. W. Gledhill; and Capt. F. J. Ingoldby, M.O.—A pine plantation was successfully established at Bunbury by the Woods and Forests Department.—Mr. F. W. Holder, the Premier of South Australia, promised Sir John Forrest that, the Commonwealth once established, and South Australia and Western Australia both having joined the federation, he would, simultaneously with the passage of a similar Bill in Western Australia, bring forward a Bill in South Australia, assenting to a transcontinental railway line being constructed stage by stage.

14th March.—The Third Contingent, or "Bushmen's Corps," for service in South Africa, embarked at Fremantle by the transport "Maplemore." Immediately following the despatch of the "Maplemore" recruiting for the Imperial Bushmen's Corps, being the Fourth Contingent to be despatched to the assistance of the Imperial forces, was actively entered upon. The strength of this corps was restricted to 125.

17th March.—A petition from the Eastern Goldfields Reform League was presented to the Governor for transmission to the Queen. The petition, which is said to have contained 27,733 signatures, prayed that the Eastern Goldfields might be formed into a separate colony. A petition from Albany, praying for the inclusion of that district, the Plantagenet, in the proposed new colony, was also presented to the Governor.

20th March.—First Wesleyan Methodist Conference of Western Australia opened in Perth.—Deputation to the Premier from the W. A. Workers' Association, urging the introduction of compulsory arbitration and a reduction on the railway freights on ore.

22nd March.—His Excellency the Governor, Sir Gerard Smith, and Lady Smith took their departure for England in the N.D.L. Co.'s s.s. "Barbarossa." Sir Alexander Campbell Onslow, Kt, the Chief Justice of the Colony, was sworn in as Administrator on the following day.

24th March.—The "Sailors' Rest," at Fremantle, opened by the Premier.

26th March.—Death of Lieut.-Colonel G. B. Phillips, Commissioner of Police. Colonel Phillips entered the Civil Service in the year 1852.

March.—The Government placed a contract for the supply of pumping machinery for the Coolgardie Water Scheme with Jas. Simpson & Co., Ltd., at £241,750.—The Governor, Sir Gerard Smith, received a cable message from the Imperial authorities, offering commissions in the Royal Artillery and Infantry to Western Australian officers.—The erection of a Central Fire Station in Perth commenced.

Digitized by Google

April.—The bubonic plague made its appearance at Fremnatle, and two fatal cases occurred.—An unusually heavy fall of rain was recorded on the Murchison. In the neighbourhood of Nannine a huge lake, many feet in depth, completely isolated the township for several days.

8th May.—The transport "Manhattan," having embarked the Fourth Contingent, The Imperial Bushmen, sailed from Fremantle for Beira. The command of the corps was given to Major James Rose; the other commissioned officers were Capt. C. C. Newland, Lieutenants C. A. Barnes, E. Vernon, F. G. Hume, and E. R. Williams, with Surgeon-Captain W. Gibson in medical charge.

17th May.—A special meeting of Parliament summoned, in order to give both Houses another opportunity of considering the question of a reference of the Commonwealth Bill to the people.

24th May.—The title of K.C.M.G. conferred upon the Hon. E. H. Wittenoom, Agent-General for Western Australia.

7th June.—The Federal Enabling Bill passed the Legislative Council.

June.—A contingent of eleven nurses proceeded to Cape Colony for service in the war. Their passages were provided by public subscription.—The Government sanctioned the removal of Western Australian exhibits from Paris to Glasgow, for the exhibition to be held in that city in 1901.

9th July.—The Royal assent was given to the Australian Commonwealth Bill.

19th July.—Execution at Fremantle of two of the ringleaders in the "Ethel" tragedy near Broome (October, 1899).—Major Moor, commanding the first Western Australian contingent in South Africa, and Private M. W. Collett, of the same corps, killed at Palmietfontein.

31st July.—The Federation Referendum Vote taken throughout the Colony. In favour of federation, 44,800; against, 19,691; majority in favour, 25,109.

13th August.—The Orient Co.'s s.s. "Ormuz," the first English homeward bound mail steamer to enter the new harbour at Fremantle, arrived from Adelaide.

19th August.—Death of Sir Malcolm Fraser, K.C.M.G., in England.

20th August.—The P. & O. Co.'s s.s. "India" arrived at Fremantle from Adelaide.

1st September.—The new lighthouse on the N.E. corner of Rottnest Island lighted for the first time.

12th September. The P. & O. steamer "Himalaya," the first English outward bound mail steamer to make Fremantle the port of *call, arrived and berthed* at the South Quay.

Digitized by Google

17th September.—Heavy snowstorms in several localities in the extreme Southern portions of the Colony.—The Government Refrigerating Works in Perth opened for the reception of produce.

21st September.—Telegraphic communication extended to Mount Sir Samuel.

28th September.—The electric tram system in Perth completed to Highgate Hill.

September.—A marble cross erected in the Church of England portion of the Fremantle Cemetery to the memory of those who perished in the wrecks of the "City of York" and "Carlisle Castle" (July, 1899).

10th October.—The Legislative Council passed the Public Service Bill.

September and October.—Several new caves in the limestone hills, between Quindalup and Cape Naturaliste, discovered and explored.

2nd December.—H.M.S. "Royal Arthur" arrived at Fremantle for the purpose of conveying the Governor General Elect, Earl Hopetoun, to Sydney upon his arrival from Colombo by the R.M.S. "Victoria." In consequence of sickness, Lord Hopetoun was compelled to continue his voyage in the "Victoria," which left Fremantle for Adelaide on the 6th December.

15th December.—Arrival at Fremantle of the transport "Britannic," conveying Imperial troops to Sydney to take part in the proceedings connected with the proclamation of the Commonwealth. The troops disembarked and marched through Perth and Fremantle. They left the same day.

24th December.—Sir John Forrest, G.C.M.G., accepted the portfolio of Postmaster General in the first Federal Ministry.

29th December.—Death, in Rome, of Bishop Rosendo Salvado, who founded the New Norcia Native Mission in 1846.

December.—A Bill passed providing for the payment of members of Parliament.

1901.

1st January.—Establishment of the Commonwealth of Australia.

22nd January.—Death of Her Majesty Queen Victoria.

30th January.—Arrival from Adelaide of the French mail steamer "Polynesien," the first vessel of the M.M. line to call at Fremantle.

12th February.—Resignation of Sir John Forrest as Premier. Mr. George Throssell assumed the Premiership

27th February.—Mr. H. B. Lefroy appointed Agent Gener *vice* Sir E. H. Wittenoom, K.C.M.G., resigned.

6th March.—Departure of the s.s. "Devon" for Natal with Fifth *Western Australian Contingent.* The command was give

Digitized by Google

Captain H. F. Darling, the other officers being Surgeon-captain I. J. Flynn (in medical charge), Lieuts. A. J. Bessell-Browne, H. M. Downes, J. S. Scott, A. Davies, J. L. Ochiltree, C. Griffiths, J. F. Messer, N. Sherrard, H. D. Forbes, A. A. Forrest, and C. W. Williams. The corps was limited to a strength of 206 men of all ranks. Chaplain E. H. Collick accompanied the contingent with the rank of Captain.

7th March.—The volunteers for the Sixth Contingent for service in South Africa went into camp at Karrakatta. Officers: J. Campbell, captain commanding; Captain E. R. Williams, Lieuts. W. H. Young, J. F. Hawkins, H. E. Bardwell, A. E. Maley, F. W. Bell, H. B. McCormick, R. Clifton, S. S. Reid, C. E. Woodrow, R. E. Wright; Dr. F. B. Reid in medical charge as Surgeon-captain.

8th March.—Sir John Forrest returned unopposed for the Swan, in the first Federal Parliament.

29th March.—General Federal elections. Elected for Senate: Messrs. Staniforth Smith, A. P. Matheson, G. F. Pearce, De Largie, E. A. Harney, and N. K. Ewing. House of Representatives: Sir John Forrest and Messrs. J. M. Fowler, E. Solomon, J. W. Kirwan, and Mahon.

30th March.—The s.s. "Karrakatta" wrecked on the N.W. coast.

31st March.—General census of Western Australia taken under the direction of Mr. Malcolm A. C. Fraser, Superintendent of Census.

4th April.—Departure from Perth for Melbourne of Sir John Forrest, to take up the position of Minister of Defence in the Commonwealth Government.

10th April.—The troopship "Ulstermore," with the Sixth Contingent, left Fremantle for Durban. The contingent numbered 120 of all ranks.

30th April.—The Royal Yacht "Ophir," with their Royal Highnesses the Duke and Duchess of Cornwall and York on board, called at Albany, and Sir Arthur Lawley, the new Governor of Western Australia, who was also in the "Ophir," came up to Perth, where Lady Lawley had arrived the previous week.

1st May.—Sir Arthur Lawley sworn in as Governor of Western Australia.

9th May.—Federal Parliament opened by the Duke of York.

16th May.—Party under Mr. J. Muir set out from Bulong to make a flying survey of the route to Eucla for the trans-Australian railway.

27th May.—Mr. Throssell having resigned as Premier, Mr. G. Leake formed a new Ministry.

17th June.—First section of the Menzies-Leonora line of railway (18 miles) opened for traffic.

Digitized by Google

20th June.—Death of Mr. A. Forrest, M.L.A., C.M.G., well-known as an explorer, and former Mayor of Perth.

4th July.—The W.A.G.R. Association called out its men, and caused a railway strike, which resulted in almost entire suspension of traffic.

16th July.—Mr. C. Y. O'Connor reported to the Federal Parliament that the trans-Australian railway would cost £4,400,000, and calculated that it would speedily pay expenses.

20th July.—H.M.S. "Ophir," with Their Royal Highnesses the Duke and Duchess of Cornwall and York on board, anchored in Albany. The Duke and Duchess arrived in Perth by train on the following day. On the 22nd they were officially welcomed in Perth, and a reception was held at Government House. On the 23rd the festivities included a Levee at Government House, the Knighting of Rear-Admiral Beaumont, the laying of the foundation stone of the Fallen Soldiers' Memoral, a review of the military forces, and the naming of the "King's Park" and "May Drive." On the 24th, the unveiling in the Anglican Cathedral of a memorial tablet to the deceased soldiers of the West Australian contingents in South Africa, the laying of the foundation stone of the new wing of the Museum, the presentation to their Royal Highnesses of a casket containing auriferous specimens at the Mint, and a Garden Party at Government House. On the 25th, the State School Children's welcome to their Royal Highnesses in the Government House Domain, a visit to the Zoological Gardens, and the presentation to their Royal Highnesses of an album of views of South Perth and Gardens. On the 26th, the departure from Perth in the "Manx Fairy," the reception at Fremantle, and the naming of the "Victoria Quay." In the afternoon of that day the "Ophir," with the Royal visitors, left for Cape Town, South Africa.

7th August.—Trades Congress at Kalgoorlie.

14th August.—A Civil Service Association formed at a meeting held in Perth.

28th August.—Resignation of Sir A. C. Onslow., Kt., as Chief Justice of Western Australia. He was succeeded by Mr. E. A. Stone.

30th August.—Report received from Mr. F. G. Brockman, the leader of the Kimberley Exploration party, that he had made no important discoveries of mineral or pastoral country.

7th September.—Mr. S. H. Parker, K.C., sworn in as a Judge of the Supreme Court.

8th October.—Federal Budget and protectionist tariff disclosed in the House of Representatives.

9th October.—Lieutenant Bell, of the 6th W.A.M.I., awarded the Victoria Cross.

30th October.—Laying of the Cape-Australian cable completed connecting *Perth with South Africa.*

Digitized by Google

9th November.—The Leake Government defeated on a No-confidence motion by the leader of the Opposition, mostly in connection with the general administration of the Railways.

9th November.—The Duke of Cornwall and York created Prince of Wales.

12th November.—Mr. Piesse sent for to form a Cabinet.

18th November.—Mr. Piesse failed to form a Cabinet. Mr. Morgans sent for.

19th December.—Captain of N.D.L. mail steamer "Neckar" arrested at Fremantle for breach of the Federal Customs Act.

20th December.—Mr. Morgans and his Ministry resigned, and Mr. Leake was sent for.—Captain of "Neckar" released from prison on giving security for his fine.

21st December.—The Federal Government decided to send further troops from Australia to South Africa.

23rd December.—Mr. Leake's new Ministry sworn in.—Lord Hopetoun, the Governor General of Australia, arrived in Perth on a visit.

4.—EXPLORATION IN WESTERN AUSTRALIA.

"Since the time of its first foundation Western Australia has never given up the subject of exploration. Unlike the other colonies, which have always gone into the matter by fits and starts, there have been always continuous expeditions from Perth."

* * * * * * * * *

"The first of the colonies to wake up again to the importance of examining the interior was, as usual, the indefatigable Colony of Western Australia."

E. TENNISON WOODS.

In 1829, from the 17th to the 30th November, Mr. Collie and Lieutenant Preston explored the country along the coast from Cockburn Sound to Geographe Bay.

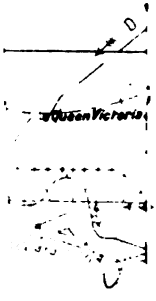
On the 15th December Dr. J. B. Wilson, R.N., made an exploration of the country near King George Sound, and discovered the River Denmark.

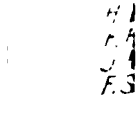
In 1830, on the 22nd March, Lieutenant J. S. Roe, R.N., Surveyor General, started on an exploring expedition in the vicinity of Cape Naturaliste, Port Leschenault, and between the Collie and Preston Rivers.

On the 29th of the same month Governor Stirling and Cap Currie explored the vicinity of Cape Leeuwin, and determined on site of Port Augusta.

From the 31st July to the 15th August, Ensign R. Dale *Regiment) explored* the country to the East of the Darling R.

Digitized by Google





Digitized by Google

Digitized by Google

From the 6th to the 22nd September, Lieutenant Erskine explored from Perth to the East of the Darling Range, and in the same month Captain J. Molloy was exploring in the neighbourhood of the Blackwood River.

From the 28th October to the 7th November, Mr. R. Dale made a second exploration East of the Darling Range. Leaving Kelmscott and passing Mount Dale, he struck the Avon, which river he followed up to the site of the present town of York. Having explored the country as far East as Mount Caroline (longitude 117° 29′ East) he turned South and recrossed the Avon, returning by his former route.

From the 23rd November to the 12th December, Lieutenant W. Preston, R.N., in a hired cutter named the "Colonist," explored the coast North of Fremantle as far as latitude 28° 45′ South, a little above Geraldton.

From 7th to 13th December, Mr. R. Dale traced the course of the Helena River.

In 1831, during the month of January, Captain Bannister travelled overland from Perth to King George Sound, and Mr. W. K. Shenton undertook an expedition to Port Leschenault to explore the Collie River.

On two occasions, in March and in December, Mr. J. G. Bussell traversed the country between the Swan River and Port Augusta.

In April, Lieutenant Preston made an excursion in a whaleboat to Point d'Entrecasteaux, and thence by land to the Murray River.

From the 20th April to the 4th May, Mr. Alexander Collie explored the country to the North of King George Sound.

Starting on the 20th September, Mr. R. Dale examined the country 50 miles to the North and South of Mount Bakewell.

On the 20th December, Surveyor R. Clint commenced an exploration of the mountain range North and East of Porongorup.

During this year Mr. J. S. Roe and Sir James Stirling, in H.M.S. "Sulphur," were occupied in surveying the South coast.

In 1832, during the month of February, Mr. A. Collier explored the country between Albany and French River, and, in May, he further explored the country near King George Sound.

In 1833, during March, Mr. F. Whitfield traced the Helena River to its source, and in July Mr. Alfred Hillman, surveyor, explored the country between Albany and Nornalup Inlet.

In 1834, during January, Mr. G. F. Moore traced the Swan River to its junction with the Avon.

In September, Mr. Thomas Turner traced the Blackwood River to its source.

In October, Mr. H. G. Smith explored the country between Greenmount and the townsite of Northam.

Digitized by Google

In 1835, from the 6th to the 26th January, an exploration of the Hotham and Williams Rivers was made by Mr. A. Hillman.

In February Mr. J. S. Roe examined the country between the headwaters of the Kalgan and Hay Rivers.

In April Mr. G. F. Moore made an excursion to the Northward of the Swan River.

From the 4th October to the 8th November Mr. Hillman explored the country lying between Kelmscott and the Williams, and thence to the Avon.

From the 19th October to the 20th November, Sir James Stirling, with Mr. J. S. Roe, and a party, made the overland trip to King George Sound from Perth, returning *viâ* York.

In 1836 Mr. G. F. Moore made two journeys—one, in the early part of the year to the Northward of the Swan, led to the discovery of the Moore River—the other, to the Eastward and Northward of Northam, opened a new tract of grazing and agricultural land within sixty miles of the Swan. In this latter trip, which commenced on the 30th May, he was accompanied by Messrs. Peter Brown and G. Leake.

During the month of May Lieutenant H. W. Bunbury, 21st Fusiliers, explored the country between the mouths of the Dale and Williams Rivers.

From June to September Mr. A. Hillman was employed in surveying a road from Albany towards Perth.

Between 20th and 23rd October Mr. H. W. Bunbury crossed from Pinjarra to the Williams.

From the 2nd October to the 11th November Mr. J. S. Roe led an expedition to the North and East of Perth, to explore the table land which lies in that direction. Although he reached Lake Brown, near the Western boundary of the present Yilgarn goldfield, the only discovery he made worthy of note was that of the Salt Lakes, which have since been found to form a marked feature of the plateau.

In 1837 an expedition, under Captain George Grey and Lieutenant Lushington, was sent out from England to investigate the truth of the report as to the existence of a large river on the N.W. coast flowing into the sea near Dampier's Archipelago.

From 2nd December of that year to 21st April, 1838, they explored the Hanover Bay district, discovering the Glenelg River.

During January, 1839, while occupied in searching for a settler named Mr. George Eliot, who had been lost in the bush for three weeks, but who eventually found his way to Port Augusta, Grey thoroughly explored the country between the Williams and Leschenault.

From 17th February to 21st April, 1839, Grey explored the country between Shark Bay and Perth, finding excellent country

Digitized by Google

for mineral, pastoral, and agricultural purposes. He claims to have discovered and named many rivers on the coast North of Perth, such as the Gascoyne, Murchison, Greenough, Irwin, and Arrowsmith.

Having lost the boats which had been previously used, his party was compelled to return on foot to Perth, a distance of some hundreds of miles. A few of them, who were too exhausted to push on as far as the capital, were happily rescued by Mr. J. S. Roe, who, as soon as intelligence of their position had been received, had undertaken an expedition from Perth for that purpose.

Soon after Grey's reports had been placed before the authorities, Mr. George Fletcher Moore was sent to examine the coastal districts in the neighbourhood of Moresby Range. His opinion of the locality was favourable, and he gave the explorer's name to the port South of Point Moore, calling it Port Grey. The harbour to the North of the point, which was found to be the better of the two, was shortly afterwards visited by Captain Stokes in the Government schooner "Champion," and received its present name of Champion Bay.

In 1837, from the 4th to the 29th April, Sir James Stirling examined the country between Perth and Kojonup.

Between the 30th November and the 15th December, Messrs. W. K. Shenton and Richard Dale made an excursion to the Collie and Brunswick Rivers.

During the period 1838-41, Captains Wickham and Stokes in H.M.S. "Beagle". began and completed an important series of coastal surveys on the North-West coast, discovering the Fitzroy and Adelaide Rivers.

In 1838, from 15th January to 25th May, an unsuccessful search was made for a channel supposed to connect Roebuck Bay with Buccaneer's Archipelago. King Sound was discovered and named, and a favourable report was given of the country in the vicinity.

In 1840, between the 4th April and 27th September, they examined Houtman Abrolhos, discovered good anchorage at Champion Bay, and carefully surveyed Dampier's Archipelago from Barrow Island to the Forrestier Group.

In 1841, with Captain Wickham invalided, the command of the "Beagle" devolved upon Stokes, and on the 24th September he sailed from Cœpang, in Timor, to complete the survey of the North-West coast South of Roebuck Bay, left unfinished by King. He found the coast destitute of good anchorages or important rivers, of a low sandy character, occasionally relieved by red sandstone cliffs or projections, but rising and improving as it approached Bedout Island. On the 23rd November the "Beagle" returned to the Swan River. In the same year, from the 12th to the 16th December, a trip was made by Stokes to ascertain the exact position of Port Grey, which he found to be almost identical with Champion

Digitized by Google

Bay, and he also explored the surrounding country previously reported upon by Captain Grey.

In January, 1839, Sir James Stirling examined the country in the Vasse district.

In 1840, from the 9th to the 26th January, Mr. D. Dring, in the "Champion," made a voyage from the Swan River to discover the mouth of the Hutt River, or an anchorage near it.

From 10th to 15th January Mr. H. M. Ommanney, assistant surveyor, examined the Capel and Preston Rivers.

In February and March the Kojonup district, and the country between there and Albany, was explored by Assistant-Surveyor Hillman and Mr. William Nairne Clark.

In that same year Mr. John Scully, with a party consisting of Mr. Drummond and others, explored the country in the vicinity of the Moore River, naming the Victoria Plains.

In 1841, from the 31st January to 27th July, a journey, which ranks amongst the greatest feats of human endurance, was accomplished by Mr. Edward John Eyre.

In an attempt, begun in the previous year, to cross overland from Adelaide to Western Australia, this explorer had been foiled, chiefly by want of water. Having sent back the majority of his party, he started from Fowler's Bay, South Australia, with one companion, Baxter, and a black boy named Wylie, to reach King George Sound or perish in the undertaking. A short distance South-West of Eyre's Patch (126° East longitude), two natives, who were accompanying them, murdered Baxter at night and stole the greater part of their provisions. Eyre and his black boy were left to accomplish a journey of some hundreds of miles through an unknown country with forty pounds of flour and four gallons of water. This they succeeded in doing after undergoing the severest hardships. This journey of Eyre's, being the first successful attempt to cross from South Australia to the new Colony in the West, was of considerable geographical importance. It may be mentioned here that this enterprise would probably have never been concluded but for their happy meeting with, and kind treatment by, Captain Rossiter, of the French whaler "Mississippi," who rendered them every assistance and kindness when reduced to the last extremity of hunger, thirst, and fatigue. This providential encounter occurred some three weeks' march from Albany.

In the month of February Mr. William Nairne Clark made an expedition in a whaleboat from Albany to Deep River, Nornalup Inlet, and Point d'Entrecasteaux, discovering immense jarrah and karri forests. Mr. Clark, in his journal, comments on the value of his timber discoveries, and also on the fact that the whole of the whale fisheries were in the hands of the American whalers, of which he says that "upwards of 150 sail, averaging about 300 tons *each, are off the coast in* the whaling season."

Digitized by Google

In December, Governor Hutt, accompanied by Mr. J. S. Roe and Captain Stokes, made an overland journey from Fremantle to the new settlement of Australind.

In 1842, during January, Mr. R. H. Bland traversed the country between the Vasse and Albany.

In the same year Mr. H. Landor made an excursion to the South-East of Beverley, and reported superior grazing country of great extent and richness.

In January, 1843, Messrs. Landor and Lefroy made a short exploration to the South-East of York and Beverley, in search of a large inland sea mentioned by the natives. Passing the head-waters of the Hotham and Williams rivers, they discovered some lakes, for the most part salt, but failed to find favourable country of any large extent.

In 1844, during December, the colonial schooner "Champion" under the command of Lieutenant Helpman, accompanied by Mr. J. Harrison, civil engineer, was again despatched by Governor Hutt, to take observations in the neighbourhood of Gantheaume Bay, at the mouth of the Murchison River. His report confirmed Stokes' observations as to the general character of the country.

In 1845, during May, Assistant-Surveyor A. C. Gregory made an excursion down the Blackwood River, and a similar one to the East of Kojonup, and down the Gordon River in April of the following year.

In 1846 Mr. A. C. Gregory, accompanied by his two brothers, Messrs. Frank T. and Charles Gregory, visited the salt lake region of the interior. Starting from Bolgart Springs, a large extent of swampy country was traversed, and a range of granitic hills, supposed to be the watershed of the coast streams, was discovered. Turning to the westward to examine the rivers reported by Grey, they found at the head of one of these, the Irwin, several seams of coal.

In 1848, between 9th September and 12th November, Mr. A. C. Gregory, with party, examined the Murchison and Gascoyne districts, and found a galena lode in the bed of the Murchison river.

In December Governor Fitzgerald, accompanied by the last-named explorer, examined the new mineral discovery, and named the Geraldine mine. On this journey he was speared by the blacks, but, notwithstanding, retained his lead of the expedition.

On the 14th September Mr. J. S. Roe commenced the longest and most celebrated of those journeys, which have led to his being styled by some historians "the father of Australian explorers."

Starting from York, he reached the Pallinup in October, and steering East, crossed *several good* streams. Then succeeded *dense scrub, dry watercourses*, and salt lakes, till

Digitized by Google

the Bremer Range was reached. No better country could be seen from the Fitzgerald Peaks at an altitude of 1,000 feet, so Roe retreated towards the coast, and only stopped to halt at Russell Range (latitude 33° 27′ South) after being deprived of water for three days and nights. On his return journey extensive deposits of brown coal were found at the Fitzgerald River. The expedition reached Perth on the 2nd February, 1849, having explored 1,800 miles of the Colony, and discovered a valuable stretch of timber country.

In 1854 a party, under the charge of Mr. R. Austin, Assistant Surveyor, was sent by Governor Fitzgerald to examine the country North and East of the settled districts, with a view to the discovery of minerals, or navigable water, and to seek pastoral and agricultural land in the Gascoyne District. In this expedition, which left Mombekine, near Northam, on the 10th July, and passed Lake Cowcowing, a considerable tract of the salt-marsh district to the North-East was traversed and examined, and several mountains and salt-lakes discovered; but, his horses having been destroyed by the poisonous box-plant, Austin was compelled to make for the coast at Shark Bay, the appointed rendezvous.

At Mount Magnet a halt was made, and the surrounding country examined. Almost as soon as the Murchison had been crossed, the party commenced to suffer terribly from want of water, and after many fruitless attempts to proceed towards their desired destination, were compelled to retreat to the river, having penetrated to longitude 115° 16′ East, latitude 26° 15′ South. Following the Murchison down, they arrived at the Geraldine Mine on the 20th November. Austin in his report to the Government indicated the existence of four fresh water streams of considerable size coming from the North-East and shedding into the Murchison. He also stated that the belt of country around Mounts Kenneth and Magnet, and in the neighbourhood of Lake Austin, was probably "one of the finest goldfields in the world."

In 1856 Mr. A. C. Gregory made his well-known journey from the Northern Territory of South Australia along Sturt Creek, tracing it as far as Termination Lake (Gregory's Salt Sea, latitude 20° 16′ South, longitude 127° 31′ East) in the North-East district of this Colony. Finding no visible outlet for the waters of this sea, he returned to his camp on the Victoria, and resumed his previous exploration of that river. During this trip the Denison Plains, to the South of the present Kimberley goldfield, were discovered.

In 1857 Mr. F. T. Gregory ascended the Murchison River to complete the survey of its unexamined portions.

In 1858 Captain H. M. Denham, in H.M.S. "Herald," assisted by Lieutenant J. Hutchison, surveyed the portion of Shark Bay lying South of Dampier Reef, including the Sound now called by his name.

Digitized by Google

During the same year a land expedition under Mr. F. T. Gregory was sent out for the purpose of exploring and reporting on the Gascoyne and Shark Bay Districts. Leaving the Geraldine Mine on the 16th April, Gregory followed the Murchison River to the neighbourhood of Mount Gould, and the intervening country having been crossed, reached the head waters of the Gascoyne. Tracing that river down to its mouth, he returned by a route somewhat similar to his outward one, and reported that there were several large tracts of good and well-watered land, suitable for pastoral purposes, to be found in the Gascoyne District. This proved a much needed encouragement to the settlers in the Colony. Mr. J. B. Roe, a son of the Surveyor General, accompanied Mr. Gregory on this expedition.

The year 1861 also was one important in the history of the settlement of the Colony, when other large tracts of country, hitherto considered useless, were added to its pastoral districts.

Mr. F. T. Gregory was sent to report on that part of the country lying inland from the North-West coast, which had previously been unfavourably reported upon by King and Stokes. From the 10th May to the 17th October, with Nickol Bay as his base of operations, he was occupied in exploring the back country near the headwaters of the Ashburton, Fortescue, DeGrey, and Oakover rivers. All these rivers were discovered and named by him, and he also discovered several large areas, notably in the vicinity of Nickol Bay, which were suitable for pastoral purposes.

From the 3rd July to the 23rd August Messrs. B. D. Clarkson, C. E. and A. Dempster, and C. Harper, were engaged in exploring the country East of Northam, and successfully penetrated the dense scrub and salt-lake country previously supposed to be impassable. They reached Mount Kennedy, and traversed a great portion of the district which now forms the Yilgarn Goldfield. Georgina Range was the furthest point reached, and here the country had considerably improved, the soil being rich and the grass excellent.

In July of this year, and *in June, 1865*, Captain E. A. Delisser, a squatter, made excursions from Fowler's Bay in South Australia, into the South-East corner of this Colony. He went in a North-West direction from the head of the Bight, and after suffering somewhat from want of water, reached a district covered with grass and saltbush, which he described as excellent for grazing purposes. His opinion of this district has since been confirmed by Mr. A. Mason and other travellers.

In 1863 Messrs. C. C. Hunt and Ridley landed at the DeGrey River, and explored the country touched on by F. T. Gregory.

In the same year, from the 7th May to the 31st July, Mr. Henry Maxwell Lefroy was in charge of an expedition organised for the purpose of exploring the district East of York, and discovering country suitable for sheep-farming.

Digitized by Google

It was partially successful in its object, as it enabled the leader to report the existence of good land for agricultural purposes. Lefroy said, however, that no settlement could take place till wells had been sunk, owing to the absence of surface water. He traversed a large portion of the present Coolgardie goldfields, and reached 122° 3′ East longitude.

In 1864, on 5th July, Messrs. B. D. Clarkson, Chas. Harper, and L. Lukin, left Doodlakine, about 110 miles East by South of Toodyay, for the purpose of discovering pastoral lands to the North and East. They encountered country somewhat similar to that met with in 1861, and having reached latitude 30° 15′ South, longitude 120° 20′ East, without finding it at all suitable, they returned, reaching their starting point on the 18th August.

In the same year Mr. C. C. Hunt left York on the 10th July for the purpose of exploring the country to the Eastward. His trip is of importance, as he passed over the present site of Coolgardie, and reached longitude 121° 55′ East (in the vicinity of the Hampton Plains). Owing to want of water he was compelled to return to the neighbourhood of Lake Lefroy, but reported that the land further out was much better than that nearer York. This journey of 400 miles was made between the 31st and 32nd parallels of latitude, and its result was disappointing. Mr. Hunt, two years afterwards, made an almost similar trip to the Hampton Plains. From the 12th to 27th September Mr. A. Dempster made a trip from the Gage River, near Esperance, to the Dundas Hills *viâ* Fitzgerald Peaks, and reported that a stock route to the North could be opened without much difficulty. In November of the same year Mr. E. T. Hooley failed to find one between Champion Bay and the Gascoyne. During this year, also, Mr. Robert Austin visited the Glenelg River, and reported favourably on the country in its vicinity.

About the year 1865 Mr. Trevarton C. Sholl made an exploration to the South of Camden Harbour. In this journey he visited the Glenelg Basin, ascended and named Mount Page, discovered the Berkelman River, crossed the Harding Range in the face of almost insuperable difficulties, and reported a large tract of good pastoral country.

In 1866, from 10th January to 28th February, Assistant Surveyor James Cowle explored the country between Roebuck Bay and Port Walcott, and reported three million acres of country known to be fit for grazing purposes, and improving considerably inland from the coast.

In this year also (16th April to 10th November) Mr. E. T. Hooley made a more successful attempt to open up a stock route to the North-West, journeying as he did in safety from Champion Bay to Port Walcott and back. During the year (1866) Mr. R. J. Sholl and his son Mr. Trevarton C. Sholl were responsible for the conduct of several expeditions from Roebourne to examine the country lying around the headwaters of the Harding, Ashburton, Sherlock, and

Digitized by Google

Fortescue rivers. They were successful in demonstrating the suitability of the land for pastoral purposes, and opening up this practically unknown district for settlement.

On the 6th of May, 1866, Mr. J. Logue sent out a party from Camden Harbour, under the leadership of Mr. A. McRae, for the purpose of exploring the country Southward. On the 10th, after crossing well-grassed level plains, in places the grass being so strong that the horses had as much as they could do to wade through it, they reached a river. They found it a fine stream 150 yards wide, running North by West. The banks were about 20 feet high, and the current ran about two miles per hour. The next day they saw 15 or 20 natives burning the grass for pigeons' eggs. The aborigines were unarmed; they were very much alarmed, and tried to hide themselves in the long grass. The party started on the return trip that afternoon, and reached Camden Harbour on the 16th.

Mr. McRae reported that "the country possessed all the advantages of a good sheep country, except that it was low, and perhaps too far North. The principal timber was the white and flooded gum, and two kinds of wattle; the boabab also grew in great luxuriance."

A period of some years now elapsed in which little or nothing was done in the way of further exploration, but, three years after Hunt's second journey to the Hampton Plains, the first of that memorable series of explorations undertaken by Mr. (now Sir) John Forrest and his brother Alexander, which have proved so important to the Colony, was concluded.

In 1869, from the 15th April to the 6th August, Mr. John Forrest, then a surveyor in the employ of the Western Australian Government, made a short expedition to Lake Barlee. Although unsuccessful in finding good land available for pastoral or agricultural settlement, he obtained a reliable survey of a great deal of country hitherto unknown, and withdrew one more district from the unexplored regions of the Colony.

The expedition was also barren of results with regard to its main object, the unravelling of the mystery in which the fate of the lost Leichardt's party is involved, but succeeded in penetrating Eastward to a considerable distance beyond Mount Margaret, reaching latitude 28° 41′ South, longitude 122° 50′ East.

In 1870 the same explorer, accompanied by his brother, made his well-known journey from Perth to Adelaide *viâ* Eucla.

Leaving Perth on the 30th March, a South-Easterly course was taken to Esperance Bay, where the "Adur," a hired schooner, was to meet them with supplies, and render any further assistance she could. From Esperance Bay an Easterly stretch of 130 miles brought them to Israelite Bay, and on the 30th May the little band of explorers started afresh. Striking inland from the coast, which had been closely followed since leaving Esperance, want of water compelled a forced march to longitude 126° 24′, where Eyre had

Digitized by Google

marked a supply. Thence the leader made a flying trip northwards, and reported the country there to be good grazing land, but without permanent water. The schooner having arranged to meet them at Port Eucla, on the 24th June they left their oasis, and after a necessarily hurried journey, throughout which their horses suffered somewhat severely from thirst, reached Eucla safely, but greatly exhausted by the hardships *en route*.

After a short trip inland, Forrest left Eucla on the 14th July, and passing through South Australian territory from that date, reached Adelaide safely on the 27th August, 1870, having accomplished the journey, which had taken Eyre twelve months, in less than five. This was possible owing to the greater facilities which the later expedition commanded, and Forrest was enabled to give a more impartial verdict as to the nature of the country passed through. In so far as this affected Western Australia it was distinctly cheering, for although Eyre's opinion of the waterless nature of the country traversed was confirmed, yet the district inland from the coast, hitherto supposed to be a sandy desert, was found by Forrest (between 126° and 129° East longitude) to be beautifully grassed, with water procurable in some places at moderate depths. To use the explorer's own words, "If water could be procured on the tableland, it would be the finest pastoral district of Western Australia."

In 1871 Mr. A. Forrest took charge of an expedition to the Eastward in search of new pastoral country. Owing to a late start, he and his party were compelled to make for the coast when they had reached latitude 31° South, longitude 123° 37′ East. This course led them to Mount Ragged, and thence proceeding Westerly they returned to Perth *viâ* Esperance, having gone out 600 miles, and discovered a considerable tract of good country, much of which has since been taken up and stocked.

In 1873, during April, Mr. William Christie Gosse, Deputy Surveyor General of South Australia, setting out from Alice Springs Telegraph Station, attempted to make the overland journey to Perth. He returned to his starting point in December, having failed to get through owing to the arid nature of the country. He, however, entered Western Australia near the Tomkinson Mountains, and examined the country in the vicinity, also that near the Cavenagh and Barrow Ranges, thus acquiring a geographical knowledge of some hundreds of miles of new country. His furthest Westerly position was in longitude 126° 59′ East, to the South of the Barrow Range.

A more successful attempt was made in the same year, between the 15th April and 29th December, by Major Peter Egerton Warburton in his journey from the McDermot Ranges in South Australia to the head waters of the Oakover River.

Although he reached the West Coast, and penetrated a district never before examined by white men, little was learned from his experiences. The expedition was provided with camels, but, owing to constant delays, provisions fell short, and sickness came. War-

Digitized by Google

burton thereupon determined to push through as rapidly as possible, travelling by night; and thus, fleeing "as it were for their lives Westward over the Sahara," the members of the expedition were too much occupied to notice carefully the character of the districts traversed. What opinion they did form was unfavourable, as the country was reported to be a sterile one, in which horses could not possibly exist, and in which nothing was visible in the way of permanent water courses. On this journey were found the Joanna Springs, since invested with melancholy interest in connection with the Calvert expedition, as the appointed rendezvous which the ill-fated explorers, Wells and Jones, failed to reach. Warburton's route throughout lay between the 20th and 22nd parallels of latitude South.

In 1874, on the 18th March, shortly before Major Warburton's arrival in Perth, Mr. John Forrest, accompanied by his brother Alexander, left that city to attempt the solution of the same problem which had engaged the attention of the two last-named explorers, the nature of the interior of the Colony, and to ascertain, if possible, whether a route to the advanced settlements of South Australia was practicable. According to official instructions he was to "obtain information concerning the immense tract of country from which flow the Murchison, Gascoyne, Ashburton, DeGrey, Fitzroy, and other rivers falling into the sea on the Western and Northern shores of this territory." Upon reaching the tropics, Forrest's further course was to be discretionary. Leaving Yuin on the 14th April, and striking the Murchison River, they followed it as far as the Robinson Range; thence struck South-East to Mounts Bartle and Russell, and North-East by the Kimberley (believed to be the watershed of the Murchison) and Frere Ranges, till they reached Weld Springs, where an unlimited supply of clear fresh water was found. The land had so far proved good, and in places—such as the basin of the Upper Murchison—admirably adapted for grazing purposes, but as soon as they had quitted their position at Weld Springs (about longitude 122° East) a succession of waterless stretches of spinifex country was encountered which would have proved fatal to the expedition's purpose but for the timely discoveries of small supplies of the precious liquid—notably at Alexander Spring. They were now within a hundred miles of Gosse's furthest West, and were pursuing an Easterly course; so, under ordinary circumstances might have expected to reach known country in a few days; but so great was the dearth of water, that a return on their own track became a serious contingency, and it was only owing to the foresight and perseverance of their leader that this catastrophe was avoided. After passing over more spinifex country and several rocky ranges, they at last reached permanent water at Barlee Springs, and found themselves in a neighbourhood already traversed by Giles and Gosse, halting, in fact, at Fort Mueller, one of the former explorer's depôts. From this point to the end of their journey, their previous difficulties recurred, but to a greatly modified extent, and the whole party reached the Peake Telegraph Station on the 27th *September, and Adelaide* on the 3rd November.

Digitized by Google

Necessity, in several instances, had shaped their course. First, in Western Australia, owing to want of water, they were prevented from penetrating as far to the North as had been desired; afterwards, when they had crossed the border, a combination of causes, including a hot, dry season, bad country, short provisions, and fagged animals, changed Forrest's intention of exploring to the South.

Whilst his report as to the chances of settlement in the spinifex region was distinctly unfavourable, with perhaps an exception in favour of patches similar to those in the neighbourhood of Mount Moore and Lake Augusta, still Forrest gave a most cheering account of the land on the Murchison beyond the then settled districts of the Colony.

It will be seen what a disadvantage he laboured under compared with Warburton and Gosse. But even thus handicapped, he only the more exhibited his ability as an explorer; for whilst Warburton, equipped with camels, hurried across the continent, losing fifteen out of seventeen beasts, Forrest not only saved a dozen of his eighteen horses, but travelling slowly, and making careful notes, was able to give a full and valuable report on the character of the country through which he had passed, and, in the words of a well-known historian, "concluded one of the most remarkable journeys on record."

Contemporaneously with these expeditions of Forrest, Warburton, and Gosse, a series of journeys was being made by a man who must always rank high amongst the noteworthy explorers of this State.

Ernest Giles had determined to accomplish a task which had baffled many explorers—the examination and opening up of the supposed desert of Central Australia; but it was not until his third attempt that he was successful; and his journey must rank next to Forrest's as the most remarkable of similar attempts, for he not only succeeded in crossing from Adelaide to Perth, but completed the circuit by returning overland to South Australia *viâ* the Murchison, and accomplished this in about twelve months' actual travelling time.

Being provided with horses only during his previous two expeditions, he failed in the former one even to reach the border, and in the second (1873-4) penetrated the desert country in two directions, only to be driven back to South Australia through lack of water. On his journey to and from Fort Mueller, no serious mishap befell him or his party, but in the flying trip during which he sighted the Alfred and Marie ranges, his companion Gibson succumbed to the perils of the desert now known by that ill-fated explorer's name.

In 1875, on Giles' third expedition, he was, through the generosity of Sir Thomas Elder, equipped with camels, and effectually proved their superiority over horses as desert-voyagers by accom-

Digitized by Google

plishing with them, comparatively easily, what his most strenuous efforts with horses had previously failed to achieve.

Leaving Port Augusta on the 23rd May, they reached Boundary Dam, in Western Australia, during August. So far the journey had proved easy, but as soon as they plunged into the Great Victoria Desert, which extends some hundreds of miles towards the West, they began to undergo the usual hardships of travellers in such districts. When nearly exhausted by a waterless stage of 325 miles, they reached Queen Victoria Springs. After a short rest here, a course North-East of the present Coolgardie goldfield was taken, and water was found at Ularring. The remainder of the journey was uneventful, and steering Westward, they reached Mount Churchman, and eventually Tootra, an out-station of Messrs. Clunes', in the vicinity of Lake Moore. At Perth, which was entered on the 18th November, they received a hearty welcome—having travelled 2,575 miles in about five months. During this expedition nothing special in the way of country suitable for settlement was discovered.

After a few weeks' rest in Perth, the return journey was begun on 13th January, 1876, its first stage being to Northampton, *viâ* Geraldton.

Giles' object in this expedition was not only to reach the Alfred and Marie Ranges which he had seen on his 1874 journey, and to connect with his route of that year, but also to ascertain how far the terrible Gibson's Desert extended to the West. Having passed the head waters of the Murchison and Gascoyne, they reached Mount Labouchere, and on the 10th May encamped on the upper portion of the Ashburton. A subordinate excursion was then made from Grand Junction Depôt northward to Ophthalmia Range and Mount Robinson, on the border of the tropics. The head of the Ashburton was reached, 350 miles from its mouth, and it was thus proved to be one of the most important rivers in the Colony.

They entered Gibson's Desert on the 1st of June, having resumed their journey Eastwards, and from the 12th to 18th of that month suffered intensely from want of water, a stretch of 230 miles being traversed without it. Soon afterwards the Alfred and Marie Ranges, and later on the familiar Rawlinson Mountains came in sight, whence, passing through South Australian territory, the Peake Station was reached on the 23rd August, a most formidable and hazardous journey having been completed with great expedition. Giles was now able to thoroughly substantiate the views of those explorers and geographers who had described the greater part of the interior of Australia as a sandy desert unfit for settlement. In performing these journeys he added greatly to the knowledge of the country traversed, and exhibited great skill as an explorer.

In 1876 Messrs. Phillip Saunders and Adam Johns, residents of the Northern Territory, South Australia, crossed, on a gold prospecting tour, from Roebourne to the overland telegraph line. Passing through the *Kimberley district*, they failed to discover

Digitized by Google

auriferous nature, but reported on good pastoral country in that neighbourhood.

In 1879, between the 25th February and the 6th October, Mr. Alexander Forrest crossed from the DeGrey River to Daly Waters Station on the overland Adelaide-Port Darwin telegraph line. Leaving Beagle Bay, he proceeded East to King Sound, and thence up the Fitzroy, which he followed for some distance, and found it to be deep and rapid. Failing to penetrate the rugged passes of the Leopold Range, he was reluctantly obliged to go round it, and proceeding up the valley of the Margaret River, discovered the well-watered Nicholson Plains, which he speaks of as the "finest part of Western Australia that I have seen."

An Easterly course having been taken, the Ord River was then met with, and its neighbourhood seemed likely to repay a thorough examination; but, with sick companions and provisions falling short, the only course open was to steer for the telegraph, still 300 miles away, which Forrest succeeded in reaching after much suffering from thirst.

This trip was a highly successful one, as he found some of the most valuable country in the Northern part of Western Australia, which has since been stocked with cattle and sheep, and where large mineral wealth still remains to be developed.

In 1883 and the following year, Mr. John Forrest, accompanied by Surveyors J. S. Brooking, H. F. Johnston, G. R. Turner and G. J. Walsh, landing at Roebuck Bay, examined a large portion of the Kimberley Division. He proceeded from La Grange Bay to Fitzroy River, examined the intermediate country carefully as far as St. George's Range, and found that it consisted mainly of rich elevated grassy plains with abundance of water. Round the lowest part of the Ord River the country was ascertained to be a fertile alluvium clothed with rich luxuriant grass. The surveyors attached to this expedition made accurate surveys of large portions of the district, traversing the Fitzroy, Margaret, May, Lennard, and Richenda Rivers. Mr. E. T. Hardman also accompanied this party and collected data which enabled him to prepare a valuable geological map.

In 1883 Messrs. W. J. O'Donnell and W. Carr-Boyd, exploring the country from the overland telegraph line in the direction of Roebourne, were fortunate in finding good country in Kimberley, and in 1884 a second expedition was undertaken by Mr. W. J. O'Donnell and party from the Katherine Telegraph Station to the same district.

In 1883 Mr. E. T. Hardman, the Government Geologist, reported indications of auriferous country in the Kimberley district, and shortly afterwards the first payable gold in Western Australia was discovered in that District by Messrs. Chas. Hall and P. Slattery.

Digitized by Google

In 1884 an unfortunate expedition was undertaken by Mr. H. Stockdale, an experienced bushman, from Cambridge Gulf, in order to explore the country in its vicinity.

From the Gulf Southwards he traversed well-watered and diversified country till Buchanan Creek was reached. Having formed his depôt there, he hoped to make further explorations, but owing to certain irregularities which had occurred in his absence on a flying trip, he was compelled to start immediately for his destination, the overland telegraph line between Adelaide and Port Darwin, and later to abandon, at their own request, two of his companions, whom he left provided with all necessaries, and to whom a relief party was despatched immediately upon his arrival at the telegraph station. This and subsequent search-parties failed, however, to discover any traces of the ill-fated men.

In the same year Mr. H. F. Johnston, with Mr. G. R. Turner as second in command, and Mr. E. T. Hardman as geologist, continued the triangulation and feature surveys from Mount Pierre, on the Fitzroy to the junction of the Negri and Ord. The course taken lay for a considerable distance South of Mr. A. Forrest's route in 1879, and led to the discovery and naming of the Mary and Elvire Rivers and numerous watercourses, "Hall's Creek" being also found, upon which is situated the present townsite of that name, the head quarters of the East Kimberley Goldfields. Mr. Hardman made an extensive geological examination of the country traversed, and reported very favourably on the auriferous character of the district, his report being important as directing attention to the Kimberley Goldfields.

In 1885 Mr. H. F. Johnston, with Mr. C. Y. Nyulasy as second in command, landed at View Hill, Cambridge Gulf, and connected that port by triangulation with the work of 1884. The course of the Ord was accurately mapped, and discovered to be wholly in Western Australian territory below the Negri Junction. The positions of the Bow, Fraser, and Behn Rivers, were also ascertained.

In 1887 the discovery of colours of gold at Mugakine led to the organisation of the "Settlers' Association," which, with Government aid, fitted out a party, under the leadership of Mr. Bernard Colreavy, to explore the country to the Eastward of Newcastle and Northam. They penetrated the country as far as the Yilgarn Hills, a distance of fully 200 miles.

About the same time a party under the leadership of Mr. H. Anstey, while prospecting in the same section, found rich specimens of gold-bearing quartz at Eenuin, which led to the more careful examination of the Golden Valley and Southern Cross districts.

In 1888 Mr. Geo. Simpson, M.E., during the month of June, made a journey to the Hampton Plains on behalf of a private syndicate. He met with and *reported* on good country in that district, *plenty of water and fair timber* being found there.

Digitized by Google

In 1888-9, the headwaters of the Gascoyne and Ashburton were explored by Mr. Ernest Favenc, a well-known Queensland explorer and historian. Setting out from Geraldton for the Upper Gascoyne, he crossed over to the headwaters of the Ashburton in the North, and discovered three important tributaries of that river, the Cunningham, Jackson, and James, all running through magnificent pastoral country.

In 1889, on the 14th of March, Mr. W. H. Tietkins set out from Alice Springs to examine the hitherto unknown country to the North and West of Lake Amadeus. Entering Western Australia near the tropic of Capricorn, late in May, he discovered and named the Kintore Range, 1,500ft. high, to the North-East of Lake Macdonald, and ascended Mount Leisler. On the 31st of the same month he left for the lake, and its circuit having been practically completed, the Bonython Ranges were discovered to the South-East. On his return journey, Tietkins passed through sixty miles of country supposed to be contained in the area of Lake Amadeus, but no vestige of this great natural feature could be seen, although the lake was subsequently found in another direction.

In 1890 Mr. F. Newman, a Swede, travelled from Fraser's Range North-East to Queen Victoria Springs, calculated to be 135 miles distant. He described the latter part of the intermediate country as poor and covered with spinifex and stunted mallee.

The same year, Mr. W. P. Goddard was sent by a private syndicate to report on the country to the North-East and East of Lake Lefroy, and in doing so, explored several districts previously unexamined. His most Easterly position was in longitude 124½° East (which was reached on the 12th September), the creek called by his name, and which is probably connected with the Ponton River in wet seasons, being discovered *en route*. About the same time the districts around Lake Lefroy and between that and Southern Cross were surveyed by Mr. Goddard.

In 1891 Mr. Lindsay, the leader of the expedition fitted out by Sir Thomas Elder to complete the exploration of Australia—more especially the Western Colony—left Warrina on 2nd May. Shortly after crossing the border, Mr. Leech was despatched on a fruitless trip Northwards to search for traces of the ill-fated Gibson, who had perished some seventeen years previously. The expedition then proceeded *viâ* Fort Müeller to Mount Squires, where water was obtained. Thence a South-West course was taken across the unknown Block A to Queen Victoria Springs. In latitude 29° 20′ South, 270 miles from Mount Squires, the Eastern edge of good pastoral country was touched. Upon reaching the springs they were found to be dry, and the intended further exploration from them as a base had to be abandoned, the party having to push on to Fraser Range; and this hasty trip through the desert from Mount Squires represented the only useful work done so far. Lindsay reported that when about half-*way to the* Range, they passed a good country of rich red soil pro-

Digitized by Google

ducing good stock bushes, but all extremely dry. A belt of country "worthy the attention of prospectors" was also met with. Having rested for some time at the Range, they set out to examine, if possible, the Western side of the desert they had just traversed, but want of water compelled them to take an extreme Westerly course *viâ* Mount Monger, to the Murchison, passing through country mostly covered with miserable thicket on a sandy soil with granite outcrops. On the 1st January, 1892, they reached their destination, where the majority of the members left the expedition, and their leader was recalled to Adelaide. In his absence, a flying trip was taken by Mr. L. A. Wells into the district known as Block A, lying between Giles' 1876 and Forrest's 1874 tracks. Starting practically from the depôt at Welbundinum, he completed his examination of practically the whole block in about six weeks, between the 23rd February and the 4th April. In this expedition he travelled 834 miles, discovered some fine ranges and hills, a large extent of pastoral, and some auriferous country, but no permanent surface water. The total area explored in the two expeditions was 80,000 square miles, and the total mileage covered 2,745 miles.

In 1896, on the 16th July, Mr. L. A. Wells, chief of the Calvert Exploration Expedition, started from Lake Way to examine the country between the East Murchison and Fitzroy Rivers.

Adopting a North-Easterly course, a depôt was formed in latitude 25° 54′ South, longitude 122° 20′ East, excellent water-holes and fair country existing in the neighbourhood. The period between the 10th August and the 8th September was occupied in a flying trip North-East through Mount Bates, on a dry stage of 200 miles, till a good well was found in latitude 23° 23′ South, and longitude 124° East, whence a return was made *viâ* Giles' 1876 route. Leaving the depôt finally on the 14th September, the party at length reached Separation Well. Thence travelling along the meridian of Joanna Springs, and, subsequently upon reaching that point, North-North-East, it struck the Fitzroy River, a little North-West of Mount Tuckfield, on the 6th November, a distance altogether from Mount Bates of 500 miles. Most of this was the usual spinifex and sandridge country, and the last 300 miles were almost destitute of camel feed or water—in fact they were compelled to abandon five beasts, and had the greatest difficulty in saving the others.

At Separation Well Messrs. C. F. Wells and G. Lindsay Jones were, on the 11th October, sent on to examine the country bearing West-North-West for 80 or 100 miles, and thence North-East to cut their leader's track about 30 or 40 miles South of Joanna Springs. On his arrival at the rendezvous six days later than had been expected, not finding the two men, Mr. L. A. Wells naturally concluded that they had arrived previously, and been compelled to push on to the Fitzroy. The fate of the unfortunate men has since been ascertained, their bodies being found by Wells some months afterwards fourteen miles West-South-West from the Springs. Their journal disclosed the *fact that, being unable to* proceed owing to the heavy

Digitized by Google

nature of the country, they retraced their steps, and, striking the expedition's track, followed it Northwards, only to perish from want of water about the 15th November.

As soon as the news that two of the party were missing reached Perth, energetic efforts were put forth by the West Australian Government, and on the 19th December, Mr. W. F. Rudall left Braeside Station on the Oakover River in charge of an expedition to follow up the river and its branch, the Davis, thence striking Eastward to cut the tracks of the missing men.

After leaving Christmas Pool some distance South-East of Mount Macpherson, Rudall, guided by blacks, came upon a camp into which footsteps, supposed to be those of the persons sought, were traceable. Here, unfortunately, all tracks were lost, and he was reluctantly obliged, through his camels failing him, to return to his starting-point. He immediately organised a second trip, but after strenuous though fruitless efforts, the party engaged on this expedition also were driven back owing to the insuperable difficulties encountered. Rumours, supplied by natives, of straying camels, etc., having reached Rudall, it was considered wise to make a further search to the South of the Oakover River, and, accordingly, on the 7th February, 1897, he again set out. The course of the river being followed for some distance, the latitude of the tropic of Capricorn was reached, and in longitude 120° 10′ East the bodies of two men, supposed to have been murdered by natives, were discovered. Returning *viâ* Roy Hill Station to Nullagine, a report of the find was sent to Perth, but, after due consideration and medical examination, it was decided that the remains were not those of the missing explorers, and a final attempt was made to solve the mystery surrounding the fate of the two men. Rudall, leaving Braeside Station on the 9th April, visited Separation Well, and attained a point 60 miles South of Joanna Springs before returning to Braeside, which was finally reached on the 23rd June. Although these journeys proved unsuccessful in their object, it cannot be said that the work was fruitless, since Rudall had travelled over an area of 23,000 square miles, and had obtained a large amount of information not previously possessed concerning the physical features of the country examined.

In 1896, from 17th June to 13th September, Mr. A. Mason, a Government officer, was engaged in examining the South-Eastern district of the Colony, lying between Kurnalpi and Eucla, into portions of which rabbits were supposed to have penetrated. He claimed to have discovered some millions of acres of some of the finest pastoral and agricultural country in the world, but reported a very poor supply of surface water. This important belt of land lies between 125° East longitude and the South Australian border, and South of about 30° South latitude. These plains were partly examined by Sir John Forrest during his 1870 overland trip to Adelaide, and both he and Captain Delisser in 1865 spoke of them in terms somewhat similar to those used by the later explorer.

Digitized by Google

In the same year an expedition was sent, under the auspices of the South Australian Government, from Oodnadatta to Coolgardie, to open up, if possible, a stock route between the two places.

The leader, Hübbe, entered the Colony near Mount Hinckley, below 26° South latitude, and keeping to the South of that parallel, followed Forrest's 1874 route through Barlee Springs as far as Mount Allott, and thence South-West by Ernest Giles' Range. travelled to Lake Wells. The remainder of the journey by De la, Poer Range and Mackenzie's Well, where a good supply of water was obtained, to Menzies and Coolgardie was through comparatively well-known country. He arrived at the latter place in August, and left some time afterwards, returning *viâ* Eucla to South Australia. Fair water was found in several places, *e.g.*, Mount Aloysius, but the same spinifex country which had harassed Forrest so much was met with throughout, with the exception of small patches of better country found near the South Australian border and during the latter part of the journey.

On 20th July an expedition, equipped and led by the Hon. David Carnegie, left civilisation at Doyle's Well, some fifty miles South of Lake Darlôt, to strike across the continent in a North-North-Easterly direction, in the hopes of finding gold-bearing or pastoral country in the great desert lying between latitudes 19° and 28° South and longitudes 122° and 129° East, which hitherto had only been crossed from East to West or *vice versâ*. Travelling over a long stretch of dry country, during which journey the camels were without water for 13½ days, they reached a soakage 45 miles South-South-West of Alexander Spring, which afforded water. Proceeding on past the Spring, which was dry, a few low sandstone ranges and hills were found, and, occasionally in the valleys, belts of bloodwood, and a few shrubs edible to camels; but most of the country was a continuous waste of sand ridges. From latitude 20° 40′ to latitude 19° 20′ South, these were again broken by occasional high tablelands and sandstone cliffs, from which small creeks ran into the sand, fine rock-pools, such as Godfrey's tank, being found at their heads. On the outgoing trip, the only permanent water—Helena Spring—was found in latitude 21° 20′ South in limestone formation. Within fifty miles of Hall's Creek one of the party, Mr. Charles Stansmore, lost his life through a gun accident. On reaching that township on 6th December, Mr. Carnegie heard of the disaster to the Calvert Expedition and at once offered his assistance, but relief parties had already been despatched. After a badly needed rest, the expedition left Mr. Stretche's cattle station in the beginning of April, 1897, and travelled down the Sturt Creek to its junction with Gregory's Salt Sea, in which were found numbers of wild fowl and fish. Following thence a generally Southerly direction parallel to the border, sand ridges commenced about latitudes 20° 30′ South, and continued in almost unending monotony as far South as the Rawlinson Range. A range of considerable *size, the Stansmore*, was found in about

Digitized by Google

latitude 21½° South, but neither auriferous nor pastoral country appeared to exist in its vicinity. Thence a Southerly course was taken to the Eastern end of Lake Macdonald. The sand ridges in this district were so frequent that in eight hours travelling 86 of them were passed over. From here a Southerly and South-Westerly course was taken past the Rawlinson Range, till the outward (1896) track was struck near Alexander Spring. Much needed water was found in the bed of Blyth Creek, and a welcome fall of rain filled the Spring itself. Crossing Lake Wells, and cutting the Erlistoun Creek near its head, the first auriferous country seen since leaving Hall's Creek was met with. From this a course was shaped through Lake Darlôt to Coolgardie, which was reached in August, the expedition having travelled three thousand miles in eight months. No permanent water was found after leaving Sturt Creek, and the impracticability of a direct stock route being opened between Kimberley and the North Coolgardie fields, was proved beyond question. It was moreover clearly shown that the desert traversed, with the possible exception of small and isolated patches, contained no auriferous country.

In 1897, from May to October, Mr. Hugh Russel was engaged on a gold prospecting tour. From Crawford's camp, 60 miles North-North-East of Mount Margaret, a course was steered *viâ* Mount Shenton to Mount Squires, the journey being mostly over desert country. The whole district in this neighbourhood, including the Barrow, Warburton, and Cavenagh Ranges, was carefully examined, but little good country discovered. Returning on his outward track, no water was found from Melango Creek to Kirkpatrick's Well, which stage occupied 13½ days.

1896 to 1898. On the 1st April, 1896, Mr. Frank H. Hann, a Queensland squatter, started from Lawn Hill, on the Gulf of Carpentaria, to prospect the North-West interior of Western Australia for pastoral country. His party consisted of one white man, six Queensland blacks, and sixty-seven horses, nine of which belonged to his white companion, who accompanied him as far as Roebourne. The Ord River was struck in about lat. 16° 37′ South, and followed up to Hall's Creek. An attempt was made from here to find a track through the desert to the head of the Oakover River, but had to be abandoned, and a course made for Derby along the Fitzroy River. From Derby, Mr. Hann went on with his party to Broome, Condon, and Roebourne. After replenishing his stores at this latter place, he followed the Fortescue River to its head, and thence North-East to Nullagine. From here Mr. Hann made a trip to the Eastward, into the desert, where he met Mr. Rudall, who was searching for the lost members of Wells' expedition. So far Mr. Hann's trip had been barren of results, and the loss of horses was so great, that, on his arrival at Derby, he was about to return to Queensland, when he met Police Inspector Ord, who advised him to try the Leopold Ranges for gold. This he decided to do, and a start was made for Mt. Broome with six Queensland blacks, 31 horses and two dogs. Great trouble was experienced in crossing the Leopold Ranges on the

Digitized by Google

West side of Mt. Broome, but an examination of the country to the North and East for about 30 miles so satisfied Mr. Hann, that he decided to at once return to Derby, and take up land in the district just visited. On his leaving Derby, Inspector Ord joined the party, and the River Adcock, which had been explored and named on the first trip, was followed down to its junction with the Fitzroy River. A high and impassable range running North-East and South-West of the river on its South-East side was named Sir John Range, and a lofty table-topped mountain to the North of the Adcock-Fitzroy junction, was called Mt. Brennan. Blacks here were very numerous. The Fitzroy River was then followed up to an impassable gorge, 200ft. deep, with precipitous sides, which was named Sir John Gorge. To get round the range, the course was altered to North-West, where splendid cattle country was noticed, and then to the South-East. A fine river from the North-North-West was struck here, which forms a junction with the Fitzroy River, about half-a-mile above Sir John Gorge. This river was named the "Phillips" by Mr. Hann, but the name was afterwards altered by the Surveyor-General to the "Hann River." On this river, four miles above its junction with the Fitzroy, a tree marked by Mr. Robert Buttons, $\frac{R\,B}{4\,4}$, was discovered. Ten miles above the junction the river is a quarter of a mile wide, and splendidly adapted for watering stock; clear, running water, low banks, no bogs, the margin solid sand, and the stream opening up every now and then into large water-holes, all of which were found to be full of crocodiles, a harmless species, about 6ft. to 8ft. long, living principally on fish. Travelling about 20 miles up this stream, a small lake was found on the right bank of the river. The lake was three miles in circumference, and very deep, and was named "Gladstone Lake." On the lake and river geese, ducks, waterhen, and many other kinds of game were in abundance. The whole country was found to be intersected with rivers, creeks, and lagoons, the timber on the river consisting mainly of coolibah, box, plum, gum, magnificent bloodwood, bauhinia, kurrajong, and baobobs. One of the latter trees was measured, and found to be 45ft. in diameter, and rose perpendicularly to a height of 100ft. In 16° 45′ South lat., the Hann River takes a Northerly course, and runs through gorges into a rough range of hills, which were named the "Caroline Ranges." About 25 miles West from here a large creek was met with, and called the "Charnley;" the travelling was exceedingly rough, and the horses in a bad state for want of shoes. In the Charnley some bream were caught, and the river was then followed down through very rough country to an impassable gorge cut through a range of high basalt hills. This range was named "Edkins." It was covered with immense stones as slippery as glass. A new kind of palm was discovered here, with a succulent head, which formed a splendid vegetable something akin to cabbage. The Leopold Ranges were again crossed by means of a pass at the head of the Barker River, near Mount Hart. Mr. Hann was of opinion that a good dray road could be made over the ranges at this point. Natives were very numerous throughout this country.

Digitized by Google

but very wild and unapproachable. They were without covering of any kind whatever, but iron implements were discovered in their camps. The last described exploration was carried out in June, July, and August, 1898. To quote Mr. Hann's own words, he "never saw better watered country in his life."

In 1901, during the month of April, the Government despatched a well-equipped party, under the leadership of Mr. F. S. Brockman, with Mr. Charles Crossland as second in command, to explore the extreme Northern end of the State, lying between the 17th and 14th parallels of latitude, and West from the 128th Meridian. That the investigation of the resources of the country might be complete, the party was accompanied by Mr. Gibb Maitland, the Government Geologist, and an assistant geologist, and Dr. F. M. House, as Naturalist. To use Mr. Brockman's own description of his trip:—Leaving the port of Wyndham on the 9th of May, the party proceeded in a Southerly direction, following the course of a previously unexplored river (named the Chamberlain) to the 17th parallel, and proceeded thence Westerly, principally over high sandstone tablelands, to the Charnley River, which had been explored and named by Mr. F. Hann, in 1899. Mr. Hann's position of this river and the neighbouring features were found to be geographically accurate. The party then traced the Charnley and Isdell Rivers Westerly from Hann's exploration to their respective points of exit in tidal waters. They also traced the course of the Sale River and tributaries (discovered by Mr. T. C. Sholl in 1865, but placed too far South by him), and the course of the Glenelg River (discovered by Sir George Grey in 1837, and also previously shown in error of latitude). They discovered and traced the course of the Calder River, and the head waters of the Prince Regent River; located the positions of the tidal waters extending inland from Collier and Doubtful Bays, and generally investigated the country lying to the South-West and South-East of the main watershed, which is situate about the 16th parallel of latitude, and to the Westward of the 126th Meridian. From the Northern fall of this watershed the Roe River was traced from its source to its exit into the tidal waters of Prince Frederick Harbour. The Moran River was discovered, and its course between the same points traced. The head waters of the King Edward River were discovered at the watershed, and this river was again picked up in about latitude 15° 15′, and its course traced Northerly to its exit into Napier Broome Bay. Portions of the shores of Admiralty Gulf, Vansittart and Napier Broome Bays, were closely examined with a view to selecting a suitable port for the district. The Drysdale was traversed from its mouth (on the 14th parallel of latitude) to the main watershed previously referred to on the 16th parallel. At the same time a sufficient number of points on the Carson River were located to enable that stream to be mapped with approximate accuracy. The Durack River was traced from the 17th parallel of latitude to its entrance into the tidal waters of Cambridge Gulf. The whole of *the country drained* by the rivers already enumerated was

Digitized by Google

investigated as closely as practicable in an exploration of this description, all high points met with being ascended, and short excursions being made at right angles to the main line of travel wherever practicable. The exploration was completed on the 20th November, by the arrival of the leader and his party at the Pentecost River, at a point previously fixed by him on the 18th May. The practical results of the expedition consist of the discovery of a large area (six million acres) of basaltic pastoral country covered with blue grass, Mitchell and kangaroo grasses, and many varieties of top feed, lying principally in the neighbourhood of the Charnley, Calder, Sale, Roe, Moran, and Carson Rivers, with some extensive areas in addition situate on the Drysdale, and in smaller patches in the neighbourhood of the Durack and its tributaries. In addition the existence of suitable ports and routes of access to enable this country to be utilised for stock raising were ascertained. Many objects of scientific interest amongst the Flora and Fauna of the district were discovered and brought back by the party. A few aboriginal weapons and implements, and a large number of photographs of curious cave paintings were obtained. A considerable amount of information was also obtained with regard to the numbers, habits, and distribution of the aborigines of the country.

In the same year, 1901, a preliminary examination of the country between Kalgoorlie and Eucla was made by Mr. John Muir, the Inspector of Engineering Surveys, in connection with the proposed transcontinental railway. The object of the expedition was to obtain further information regarding that tract of country lying between the Coolgardie Goldfields and the South Australian border, South of the 31st parallel of latitude, with a view, in the first place, of determining the probable cost of constructing a railway through that country, and, secondly, of ascertaining the nature and resources of the country proposed to be crossed. Muir took with him three months' supply of provisions, eleven carrying camels, and five riding camels. The latter were required to explore the outlying country for as great a distance as possible on both sides of the line followed by the main caravan, and to search the surrounding country for water. Two were utilised on one side of the line of march, and two on the other side; the fifth was kept as a reserve. The expedition left Kanowna on the 16th May, followed the North-West side of the lake country as far as Kurnalpi, and from there turned South-East to Cardinia, a granite rock lying about 50 miles East of Bulong, which was reached on the 23rd. Here the camels were given a four days' spell, while Muir examined the country Westward towards Bulong, and two members of the party were sent ahead to see what the Jumannia water supply was like. A move was made to the latter place on the 28th, and thence the expedition proceeded to Goddard's Creek, about 60 miles further on, two men again being sent ahead to examine the prospects of finding water. While the caravan followed slowly the camel pad made by the advance party, Muir examined the country for about 10 miles on either side of the line of march. On the 31st the two men were met, who brought news that they had

Digitized by Google

discovered a soak. On the 2nd June the creek was reached, the camels having been five days without water. Later on a dozen or more similar soaks were discovered, but the supply in every instance was very limited. Mr. C. H. Babington, who was Mr. Muir's chief assistant, found a good soak some 12 miles down the creek, and the main caravan was moved on to it on the 4th June. Muir meanwhile, with two men, three camels, and a week's provisions, went North to examine the country, having been informed that frequent rumours were heard from the natives of the existence of a "big water" never yet seen by white men, but supposed to be situated 20 or 30 miles East or South-East of Victoria Springs. Having, however, continued his excursion for over 50 miles without finding any water, he returned to camp on the 8th June. On the 10th June the country in the neighbourhood of the camp was explored, and, as a result of this examination, the camp was shifted, on the 11th June, to a soak nine miles Eastward, in the bed of the creek. Babington, who had been exploring ahead of the expedition, here rejoined the party, and reported that water was obtainable 30 miles down the creek. Another exploration Northward for water, commenced on the 16th, proved as fruitless as the former one, and on the 21st, Muir returned to the main camp on Goddard's Creek. Babington unfortunately had been equally unsuccessful to the Eastward. The leader of the expedition therefore decided to make for Eyre, about 150 miles to the South-East. On the morning of the 25th June the main caravan started for Yayoudle Rock, Babington, who was in charge, being instructed that, failing to find water there, he was to proceed to Eyre. On the same date Muir himself, with one man and two camels, started to examine the country along the probable course of the railway. Being unable to find any water, he also proceeded to Yayoudle Rock, which he reached on the 1st July, and where a small supply of water was found. On the following day he climbed the hills in the neighbourhood to look for the main caravan; on returning to camp he found Babington waiting for him there, who informed him that the caravan was some 20 or 30 miles on the road to Eyre. With all despatch Muir then pushed on to the latter place, reaching there on the 3rd July, and finding that the main party had arrived on the previous evening. From Eyre he sent the main caravan to Mundrabilla Station, on the coast, about 100 miles further Eastward, where water could be relied upon, while he, himself, with two men, started out to work the inland country. He left Eyre on the 6th July, and after travelling 70 miles North, went Eastward 100 miles, and next 30 miles Southward to Mundrabilla. Nothing of any moment occurred on this trip worth particularising, and on reaching Mundrabilla on the 14th, he found that the camel train had arrived the previous day, and that Babington, with one man, had gone on a previously arranged special trip, 60 miles out, in a Northerly direction. On the 17th Muir left, with one man and two camels, to examine the remaining portion of the line, from a point about 30 miles North of Mundrabilla, to Eucla, the main caravan travelling to the latter

Digitized by Google

place along the coast. Muir arrived at his destination on the 19th, the caravan arriving on the 20th. On the 29th the return journey was begun. About 50 miles North from the coast, the Westward course commenced, in latitude 31 deg. South. At Wadalynia Rock, on the 12th August, a splendid water supply was found, and on the 16th another, still more plentiful. Goddard's Creek was reached on the 20th, and Bulong on the 29th. The total distance travelled was about 1,100 miles. The country traversed was mostly waterless, though well grassed and timbered, game—kangaroos, emus, and turkeys—being fairly plentiful in the vicinity of the rock-holes.

5.—HISTORY OF MINERAL DISCOVERIES.

(*Revised by A. Gibb Maitland, Government Geologist.*)

The discovery of gold in New South Wales and Victoria, in the year 1851, wrought an almost magical change in the material welfare of those colonies. Where, prior to that date, the growth had been comparatively tardy, now began an era of rapid and substantial progress. The population increased, towns and cities arose, roads were opened, while agricultural and all other industries were stimulated, and a strong local market was at once created for all industrial products.

It is hardly, therefore, to be wondered at that the attention of the early settlers in Western Australia was directed towards the discovery of mineral deposits.

The history of mining in this State dates back as far as the year 1842, with the finding of lead and copper in the Victoria District. The discoverer of copper was a man named Thomas Mason, at that time following the humble occupation of shepherd in the employ of the late Mr. James Drummond. He was stationed at Wanerenooka, and there found the deposits which were afterwards worked with success. Mr. Mason sold his find for £100, and a promise of £100 a year and work for three teams, if the parties were successful in purchasing the land, which in those days had to be put up to public auction. The annuity and work were to continue so long as the mine should be working. The company which was subsequently formed did not ratify the £100 a year part of the arrangement; but Mason worked a team on the road drawing copper ore during 1858 and 1859, until he left this Colony for the gold diggings in Victoria. Several mines were started, and smelting works erected by English companies, who worked them at a

Digitized by Google

profit for many years. The first great check these mines received was caused by the exodus of miners to the Victorian goldfields, and as no others were to be obtained in the Colony, and very few would leave England for any other part of Australia but Victoria, the mines were practically closed down. A second attempt was made to work them some years later, but it was not altogether a success, owing to the great fall in the price of both lead and copper, iron having in a great measure replaced copper in ship-building and lead for pipes, tanks, and roofing; not to mention the phenomenally rich discoveries of copper in South Australia and Spain, which flooded the market.

1846. In the year 1846 Mr. A. C. Gregory reported the discovery of coal on the Irwin River. In July of the same year, Mr. Beacham, while digging a drain on the South side of the Murray River —about 35 miles from Fremantle—found specimens of a substance resembling coal. Samples were submitted to Mr. Birch, an English chemist, residing at Fremantle, who at once pronounced them "coal of an inferior quality, similar however to that usually found at or near the surface." The discovery was confirmed by Messrs. Singleton, Lefroy, Nash, and Moore, who, a few days after, visited the Murray.

Public meetings were shortly after held at Perth and Fremantle, and committees were appointed to raise money for prospecting purposes. In September, the prospectus of the first mining company organised in Western Australia was issued, "The Western Australian Mining Company," with a capital of £20,000, in 10,000 shares of £2 each.

1847. The Government, about this time, realising the importance of the discovery of coal beds in the Colony, offered a reward of 2,500 acres of land to any person discovering a payable coalfield. Thus encouraged the company immediately commenced operations at the Murray, but the results not meeting the expectations of the sanguine shareholders, the latter became dissatisfied, and in March, 1847, Dr. F. Von Sommer, an expert from abroad, commissioned by the Government to examine and report on the coal and mineral resources of the Colony, visited the workings and expressed himself as not being very hopeful as to the prospects of coal being found in payable quantities. In December work was discontinued at the shaft, owing to the presence of water and quicksand. Dr. Von Sommer stated that he had found evidences of the existence of "subterranean lead veins" in the neighbourhood of their prospecting works, but at the same time said "shafts sunk in this district were not promising or worth continuing, for with the increase of depth iron took the place of lead." As indications of copper had been found near Kelmscott, the company, in hopes of finding lead or copper ore in payable quantities on their property, continued operations until the latter part of the year 1849, when, not finding any encouraging prospects, and fears being entertained by the shareholders that it would be necessary to levy an assessment to carry on the work,

Digitized by Google

they decided to abandon the property and dissolve the company, which was finally accomplished in the early part of the year 1850.

In the years 1848 and 1849, Capt. Roe, then Surveyor General, and Mr. Gregory, Assistant Surveyor, reported the discovery of coal in the bed of the Fitzgerald and Phillip rivers, on the South coast, about 100 to 150 miles East of Albany, but, unfortunately, in both places the seams proved to be valueless.

1848.

The copper and lead deposits on the Murchison were discovered in 1848; specimens from this vicinity were first received in Perth during August of that year, and on being sent to Adelaide for assay were found to contain not only copper and lead, but also "traces of gold," and one piece the assayer certified as being richer in silver than any ore found up to that time in South Australia.

The Government immediately despatched a party to the scene of the discovery, under the leadership of Mr. A. C. Gregory, who in his journal wrote: "Mr. Walcott brought in some specimens of galena which upon examination proved to be abundant in the bed of the river."

Mr. Gregory found, near the Bowes River, "garnets, iron pyrites, and a mineral resembling plumbago," and had "little doubt a further search would develop many hidden sources of wealth."

In the *Government Gazette* of 20th March, 1849, the public were notified that, on the 18th April, 640 acres of mineral land on the Murchison River would be offered for sale by auction at an upset price of £1 per acre. The property was purchased by a Perth Company, organised with a capital of £640, in 32 shares of £20 each. A mine was opened, and named the "Geraldine"; Messrs. A. O'G. Lefroy, G. Shenton, and R. M. Habgood were elected trustees of the company, and Mr. W. Burges superintendent. The next step was to advertise for tenders to extract and haul 100 tons of ore to Champion Bay. Meanwhile it had become noised about that the natives in the vicinity of the claim had threatened hostilities; in consequence of this rumour no one was very anxious to take contracts for mining and carting through this unknown region. In this extremity the Government were petitioned to furnish a guard of soldiers; the petitioners' prayer was granted, the authorities promising an escort of 25 men. But even after this promise there was no rush of teamsters, and a meeting of the company being called, it was decided to purchase a team. However, while negotiations were pending for the purchase of horses, the company succeeded in hiring two teams for a term of three months; then miners were engaged for the same period, and the party, accompanied by a guard of seven soldiers, started for the Murchison. On arrival at the mine the party in a short time succeeded in taking out over a ton of lead ore, which was at once despatched to Champion Bay. Mr. Burges, in his report to the directors of the company, was very enthusiastic over the prospects; he had found copper and zinc, and as there was plenty of timber in the vicinity, he advised that smelting works be erected in the neighbourhood of the mine.

1849.

Digitized by Google

In January, 1850, the mine was sold by the original shareholders for £1,600, payable in shares. A new company was immediately launched with a capital of £6,400, in 1,280 shares of £5 each. Mr. R. J. Sholl was appointed secretary, and it was resolved to obtain the services of an experienced mining captain, and to erect a furnace. The new captain, a Mr. James, in a most glowing report from the mine, stated "that there was a fine lode 2ft. 4in. wide with 18 inches of solid galena." The copper ore found on the property proved exceptionally rich, samples assayed by Mr. Gregory carrying on an average over 25 per cent. of that metal.

1850.

In the latter part of 1852 three or four parties were despatched to the Eastward of York and Newcastle, seeking for gold; but owing to climatic causes—scarcity of feed and water for their horses—they were forced to abandon the search when but a short distance from the now well-known Yilgarn Goldfield. It is but reasonable to suppose that there were no experienced prospectors in the Colony at that time, and as there is nothing in the general appearance of a gold-bearing country to attract the attention of the inexperienced gold-seeker, it is nothing more than could be expected that, as we subsequently learn, they passed over good indications without even suspecting the presence of the precious metal.

1852.

Rich specimens of gold-bearing stone were found in 1852-53 by shepherds and others, out Eastward, but unfortunately they were unable to afterwards locate the places where they discovered the stone. On the strength of these finds the sum of £357 was subscribed at a public meeting held in Fremantle in January, 1854, towards a reward to be given for the discovery of gold in the Colony.

1853.

Quite an excitement was caused in March, 1854, by the reported discovery of gold at Cardup, about 25 miles from Fremantle, and in a few days over 100 men were on the ground. Mr. A. C. Gregory visited the spot, and found that the prospectors had sunk six or seven holes to a depth of from three to fifteen feet, the diggers claiming to have found gold in all of them. Mr. Gregory, upon examination, found it to be yellow mica and iron pyrites scattered in small particles through a formation consisting of decomposed slate and quartz. After a critical analysis he could not find the slightest trace of gold in any of the stone, and was of the opinion "that the chemical agents used by those who found gold in specimens of rock taken from Cardup had been adulterated with the precious metal, either accidentally or by design, to attract public attention, as had been the case on more than one previous occasion."

1854.

In the same year Mr. Gregory visited the Murchison District, and, at the Bowes River, found in a fragment of quartz, taken from a vein in that neighbourhood, a very minute speck of gold, and this, he said, was the only occasion on which he observed gold in the rocks of the district. Later that year, Mr. Austin ascended to the top of Mount Magnet, where he found "small,

Digitized by Google

delicate layers of a crystalline substance resembling quartz; the rock had great magnetic power; each bit of stone had two poles like a magnet or loadstone, attracting and repelling the point of the magnetic needle." For this reason he named it "Mount Magnet." He further said that "the geological formation of the country east of the Murchison River had every appearance of being one of the finest goldfields in the World."

1855. In the latter part of the year 1855, high-grade copper ore was discovered at the Bowes River. The property—90 acres in extent—was purchased by Mr. Jas. Drummond for the Wanerenooka Mining Company. In 1856, 57 tons of copper ore were shipped from the Bowes and Murchison districts. The account sales of the first shipments from the Wanerenooka mine showed that the ore realised £27 13s. 4d. per ton, and shareholders were jubilant. The balance-sheet of the company for March, 1858, showed that they had a credit balance of over £1,350, while the property was valued at £9,400.

1857. In the Blue Book, 1857, Mr. F. P. Barlee, then Colonial Secretary, under the "Return of Manufactories, Mines, and Fisheries," made the following entry: "Mineral indications abound in the Northern parts of the Colony. Specimens (surface) of gold have been found, and there is but little doubt that gold will eventually be found in Western Australia to a large extent."

From 1857 to 1864 the search for gold was carried on, but, unfortunately, without meeting with the success it deserved.

1859. The Wheel of Fortune and several other mines in the Champion Bay district were opened up, and by the end of 1859 the shipments amounted to 941 tons, all remarkably high-class ore; sales of large parcels were made at Swansea, carrying from 20 to 35½ per cent. copper, and realised up to £35 14s. per ton. Up to the close of 1859, in all 577 tons of pig lead, valued at £11,640 sterling, were shipped from the Geraldine Smelting Works; after the latter date but little smelting was done.

1861. In the latter part of 1861 Mr. Panton, while on a trip to the Eastward of Northam, picked up several specimens of gold-bearing quartz. Public meetings were immediately held, and in a short time the sum of £2,500 was privately subscribed, whilst the Government promised an equal amount for the discovery of a workable field within a radius of 150 miles of the Perth Post Office. A short time after a shepherd brought into Northam several specimens containing free gold, which he found 25 or 30 miles to the Eastward, but most unfortunately he was unable to find his way back to the spot where he had discovered the gold-bearing stone.

1862. In 1862 the Government engaged Mr. E. H. Hargraves, a practical miner, who had discovered the New South Wales goldfields in 1851, to search for precious minerals throughout the settled districts of the Colony, for a period of six months or longer if necessary. Landing at Albany, he prospecte

Digitized by Google

Northam and through the Darling Range. He made a very unfavourable report, stating that the formation of the area over which he had travelled was of such a character that gold would never be found in large or payable quantities; indeed, so confirmed was he in his opinion that in January, 1864, he wrote an article on "The non-auriferous character of the rocks of Western Australia," which was published in the Journal of the Royal Geographical Society of that year; Hargraves, however, expressed the opinion that the Colony was rich in copper, lead, and iron.

1864. In 1864 a convict named Wildman, serving a 15-year sentence at Fremantle, told the prison authorities that in 1856 he was first mate of a Dutch vessel, the "Maria Augusta," which became disabled on the Nor'-West coast. They anchored in a bay (supposed to be Camden Harbour) to make the necessary repairs. While there he wandered off a short distance in the bush, where, in a certain place which he had marked, he in a short time found eight nuggets of gold, which he disposed of to a bullion dealer in Liverpool for £416. He offered, if the balance of his term (12 years) was remitted, to lead an expedition to the spot. A company was quickly organised, the Government contributing £150 towards defraying the expenses, and Mr. Panton, inspector of police, was appointed leader of the expedition, which sailed from Fremantle in the "New Perseverance" on March 2nd. On reaching Camden Harbour Wildman refused to point out the spot. Mr. Panton and his party searched diligently, traversing the country 20 miles inland, but failing to find any signs of the precious metal, they returned to Fremantle.

1865. In 1864 and 1865 parties under the leadership of Mr. C. C. Hunt penetrated to the Eastward of York, 300 miles or more. They named the "Hampton Plains" in honour of the then Governor, and on the second trip (1865) formed a camp on them and explored the country for many miles in all directions, visiting Lake Lefroy and the Dundas Hills, and it is more than probable travelled over the rich Coolgardie goldfields. Mr. Hunt said: "The Hampton Plains would require a large expenditure in making dams and digging wells before they could be used for pastoral purposes," and he described the large masses of trap rock abounding in that vicinity as being similar in character to that which he had seen on the Victorian goldfields. Specimens were sent to the Rev. W. B. Clarke, at Sydney (at that time considered one of the best geologists in Australia), who in his report described one piece as "cavernous quartz, part of a vein."

1869. In the *Government Gazette*, 20th July, 1869, £5,000 reward was offered for the discovery of a payable goldfield within 300 miles from any declared port of the colony, to be paid after 5,000 ounces of gold, either alluvial or extracted from quartz, had been shipped to Great Britain.

1870. Acting-Governor Bruce, in his report on the "Condition of the Colony" in 1870, considered "the geological formation such as would indicate the presence of gold." At this period the

Digitized by Google

Darling Range claimed the almost exclusive attention of gold seekers, and considerable work in a crude way was performed at various points; a party at North Dandalup claimed to have discovered an immense reef over sixty feet wide, which could be traced on the surface for over half a mile, and to have obtained gold from three holes sunk on the reef. A report was current in January, 1870, that gold had been found at the Blackwood.

Alluvial gold was found by a shepherd at Peterwangy, near the Upper Irwin River, specimens of which were exhibited by Mr. R. B. Pearson at Geraldton. The Government sent a sub-inspector of police to the locality, where he was successful in obtaining gold at various spots over an area of ten square miles of country. An old miner visited the scene of the find, and said that "with water he could make 15s. to 20s. per day, but at that time it was hot and dry, a veritable desert, no water, no shelter, not even a stick with which to make a fire." Mr. H. Y. L. Brown, Government Geologist, made in 1870 an inspection of the Peterwangy field, and while he found gold "much rounded and water-worn, the particles small, and in some cases hardly perceptible to the naked eye," said: "Judging by the absence of any clayslates, schists, and sandstones of a very early geological age, so characteristic of the gold-bearing country in Victoria, I am obliged to record my opinion that gold will not be found there in quantity, or over a wide extent of country." After a visit to the Mount Tallering district in 1871 he said: "With regard to the geological formation of the rocks met with . . . some were almost identical with the gold-bearing rocks of Victoria. Near Tallering, Mullewa, and Nancarron," he concluded, "there was a large extent of similar country in which gold might be looked for."

In a despatch to the Governor in 1870, the Earl of Kimberley, then Secretary of State for the colonies, waived all rights, so far as the Home Government was concerned, to minerals on Crown lands.

1871. Two prospectors sank two shafts at Peterwangy in the early part of 1871. In one they struck a quartz reef about 18in. wide, from the casing of which a few fine colours of gold were obtained.

1872. In 1872 specimens of quartz from Kelmscott, Newcastle, and Baylup were assayed at the Sydney Mint, and found to contain gold. The Rockingham Bay Mining Company, incorporated that year, obtained very encouraging prospects in their claim at the Serpentine.

In the same year, rich copper and lead deposits were found near Roebourne, and in 1873, 60 tons of copper ore were shipped from Cossack. A very rich copper vein was opened about 50 miles East of Roebourne in 1890. It more than paid expenses from the start, and in two years over 700 tons were shipped from there to England.

Digitized by Google

In 1873 a party of 16 Ballarat miners were engaged to prospect and mine for precious metals. Their expenses were paid by the Government, and great results were anticipated, but nothing was realised from the venture. The Government also erected a quartz-crushing mill at Fremantle. The initial crushing was made in October, 1874, but in a short time the mill ceased working.

1873.

A quartz reef was discovered at Kendenup, near Albany, in 1873, which, according to assays made in Melbourne, contained over 1oz. of gold to the ton. On the strength of this report, the Standard Gold-mining Company was organised, with a capital of £3,000. A battery was erected on the property, but after several crushings with very discouraging results, the undertaking was finally abandoned.

It was reported in 1877 that rich quartz reefs had been discovered—said to carry over 5oz. of gold to the ton—near Roebourne.

1877.

In February, 1880, Mr. E. B. Beere, a small squatter and farmer residing near the Byeen Brook, in the Toodyay district, brought to the city of Perth a piece of ore which he presumed to be a specimen of copper. The specimen was given to a business firm in Perth, and was for many years used as a paper-weight. Then Mr. Lawrence, a well-known boatbuilder, secured it, and while in his possession Mr. R. Greaves and Mr. E. Paine examined it, and at once pronounced it to be gold. Greaves was given about 1lb. weight of the stone, and from it "he obtained 6oz. of gold, which he sold for £4 an ounce." Mr. Beere had told someone that where he had found the supposed copper specimen there was a large outcrop, with more of the stuff lying loosely around. Greaves and Paine first saw the specimen in 1886, and immediately went in search of the locality from whence it had come. They returned unsuccessful, but again with Mr. Anstey they took up the quest, and it is stated found gold on Mr. Glover's property at Bindoon. A third time Greaves, Paine, and another tried to locate Beere's supposed find, going over the Wongan and Wyening runs, formerly in possession of Beere. They reported finding gold at the Wongan Hills, but no sign of a rich reef or alluvial deposits.

1880.

In 1882 Mr. A. McRae, while riding from Cossack to Roebourne, picked up a nugget of gold weighing 14oz.

1882.

Mr. E. T. Hardman, at that time Government Geologist, after a personal examination of the supposed gold-bearing rocks in the neighbourhood of the Bunbury, Blackwood, and Margaret Rivers, in his report under date of 30th January, 1884, said: "The rocks of this large tract are true metamorphic rocks of many varieties; they contain numerous bands of slate, and many quartz veins, most of which take a N.W. course so common in the auriferous veins of Victoria. Now metalliferous veins are so constantly met with in these rocks in all parts of the world, that I cannot believe Western Australia is the single exception, and I can only arrive at the con-

1884.

Digitized by Google

clusion that they have hitherto escaped notice for want of careful and systematic searching."

He then visited the Kimberley District, and considered it "extremely likely that that part of the district occupied by the metamorphic rocks would eventually prove to be, in some degree at least, auriferous; it may be in payable quantity." He recommended that a search be made for gold in the section "between the Napier Range and Mount Broome, on the Leonard and Richenda Rivers, the most promising portions being where the principal slate country commences. In this section numerous quartz veins may be observed, varying in width from a few inches to 30 feet." He also expressed the opinion "that if gold existed at all in the Kimberley on the West side of the Leopold Range, it would be found somewhere in that locality."

In his final report, made after his return from the North, he said, "the gravel-beds along the banks of the Elvire, Panton, and Ord Rivers are often from 20 to 40 feet in thickness, and wherever prospected yielded good colours of gold, a fact which is easily understood when it is known that they are the *detritus* of the quartz bearing schists and slates to the West of the Albert Edward Range; these gravel-beds sometimes extend to a distance of three or four miles on either side of the river." In several instances he found colours of gold at considerable distances from the quartz-bearing rocks from which only the gold could have been derived, which indicated that there were larger quantities of gold in the quartz veins and drifts overlying them. In conclusion, he "hoped that the district would prove a success as regards payable gold; intending prospectors must, however, be prepared to expend and perhaps lose money, but the appearances were quite good enough to justify this risk." Shortly after the publication of Mr. Hardman's first report, steps were taken to organise and equip a party to prospect the Kimberley district, and at the session of the Legislative Council held in August, 1884, £1,000 was placed upon the Estimates "to be expended in prospecting for the discovery of a goldfield."

1885. Mr. Grant, in the Legislative Council on the 28th of August, 1885 moved that "to a party of gold-diggers now organised, in Perth to prospect the Kimberley District, be given the loan, or help of horses that are not in use by the survey party in that district in the summer months"; but while this question was being debated in the Chamber, a party consisting of Messrs. Hall, Slattery, and others, miners from the Eastern colonies, had already arrived in the Nor'-West, and on the 30th of August they left the Yeeda station on the Fitzroy River. They first found gold on one of the branches of the Elvire, where in a few days they took out 10 ounces. From thence they prospected the Margaret and Ord rivers, finding good colours in almost every prospect hole.

1886. The Legislative Council, in June, 1886, was congratulated by Governor Broome "on the discovery of an extensive goldfield of rich promise in the Kimberley District," and on the

Digitized by Google

16th of August at that session the first "Goldfields Mining Bill" was passed.

The question as to who was the first discoverer of the Kimberley goldfields came up before the Legislative Council. Mr. Carr-Boyd claimed to have discovered a rich reef and sent several cwt. of the stone to Melbourne before the Hall party appeared in the district; he applied to the Colonial Secretary to have his claim recognised to the reward offered for the discovery of a payable goldfield, but after examination the Government made an award of £500 to Hall, Slattery, and party.

The Kimberley Goldfield was proclaimed on the 20th of May, 1886; and Mr. C. D. Price, was appointed Warden. Prospectors rushed in from all parts of Australia, and by the 30th of June, there were probably from 1,500 to 2,000 men scattered over the auriferous area. During the year many rich reefs were discovered throughout the district, and several parties obtained enough gold from surface rock by the primitive dollying process to more than pay expenses. Mining companies were floated, and in November, 1887, machinery reached Hall's Creek for the Nicholas Mine, located on the Margaret line of reef. Up to the 30th June of that year, 72 quartz claims had been located and registered at the Warden's Office.

The Legislative Council, in 1886, placed upon the Estimates the sum of £300, "to provide the necessary expenses of a prospecting party to examine the reported gold-bearing country to the Eastward of Newcastle." Later a further sum of £300 was appropriated "for the purpose of giving assistance in the work of prospecting for gold in the neighbourhood of the Upper De Grey, Oakover, and Fortescue Rivers." It was suggested by the mover, "that Mr. McPhee be given the preference," as his name was well-known to all who had read the reports of the gold discoveries in the Kimberley district.

In 1887 Mr. Glass, at Mugakine, while digging a tank found a good sized speck of gold; he sank several prospecting holes in the vicinity of the find, but without success. The discovery, however, led to the organisation of the "Settlers' Association," who, with Government aid, fitted out a party to prospect the district to the Eastward of Newcastle and Northam. This party, under the leadership of Mr. Colreavy, penetrated the country as far East as the Yilgarn Hills, a distance of fully 200 miles; while he was not successful on the first trip, so highly was Colreavy impressed with the appearance of the country, that he immediately set out on a prospecting trip on his own account.

1887.

While Colreavy was out on his second trip quite a sensation was caused by the return from Yilgarn of Mr. H. Anstey with rich specimens of gold quartz. This gentleman had gone in the same direction as Mr. Colreavy, intending to prospect still further to the Eastward. After further prospecting at Anstey's discovery it was found that although the surface indications

Digitized by Google

were good, the reef soon pinched out. Fortunately, just at this time Colreavy, who was prospecting in Golden Valley, ten miles further South, found a small reef which carried gold throughout the stone. This caused a rush, and several gold-bearing reefs were found. Prospecting was carried on still further South and East by Riseley and others—representing the Phœnix Company—who discovered several rich reefs 30 miles from the Golden Valley, at a place which they named "Southern Cross," from the fact of having made use of that constellation as a guide while travelling by night towards the site of the find.

Mr. W. J. Parker, with a party, found good indications in country some 40 miles South of Golden Valley, which he called Parker's Range.

1888. The discovery of tin at Greenbushes, in the year 1888, would seem to have been due to the researches of the late Mr. E. T. Hardman, a former Government Geologist. This gentleman, while engaged upon official duties in the Blackwood District, was accompanied by a Mr. Stinton, to whom Mr. Hardman suggested the probable occurrence of tin-bearing deposits. Having this in mind, Mr. Stinton, in 1888, whilst out kangaroo-hunting, at Greenbushes, found a small quantity of stream tin in a gully near the Blackwood River, not far from the main road, about nine miles from Bridgetown and 52 miles from Bunbury. A large number of leases were at once taken up, but as the old regulations did not at the time contain any labour clauses, very little work was done. Mr. Stinton was subsequently, in 1891, awarded £250 by the Government.

Mr. H. P. Woodward, F.G.S., F.R.G.S., at that time Government Geologist, visited the Eastern fields in February, 1888, and expressed upon the whole a favourable opinion of the Yilgarn District. The Government awarded Mr. H. Anstey £500, and Messrs. Colreavy and Huggins £250 each for the discovery of the Yilgarn Goldfield.

The Yilgarn Goldfield was proclaimed on the 1st October, 1888. Mr. Alpin F. Thomson was appointed Acting-Warden, and was succeeded by Mr. J. M. Finnerty in May, 1889.

Two promising reefs—the Mallina and Pedawah—were discovered in 1888 at Mallina to the Eastward of Roebourne. Several other reefs showing free gold were soon after found in the vicinity. In July a rich alluvial find was made at Pilbara Creek, and in a short time a large amount of gold was taken from the gravel. Mr. A. Villars found a nugget weighing 127oz., and several were unearthed from 30oz. to 40oz. each.

The Pilbara Goldfield was proclaimed on the 1st October, 1888. Mr. C. W. Nyulasy was appointed Warden. The Government awarded Messrs. J. H. Wells £500, N. W. Cooke £250, and H. & J. Withnell £100 for the discovery of the Pilbara Field.

Gold was discovered a few miles North of Cuddingwarra by a prospector named Burke, but it attracted little attention

Digitized by Google

at the time. It was also reported that gold had been discovered in the Wongan Hills, about 60 miles North-East of Newcastle.

1889. Rich deposits of alluvial gold were discovered on the Ashburton River in 1889, a large quantity being taken out in a few months.

During the same year the Central, Central Extended, Fraser's, Fraser's South, and other companies were organised in Perth and Fremantle. Mills and condensers were erected at Southern Cross, and on the 25th November the Fraser's Mill commenced crushing, followed in a short time by the mill of the Central Company. The Warden reported that 71 leases had been applied for during the year.

So many rich patches of alluvial were found in the Pilbara district, that quite a rush set in, the excitement extending to the Eastern colonies; syndicates were formed in Melbourne and other centres, and prospectors were soon scattered over the interior of Western Australia from Yilgarn to Kimberley. The Lady Carrington Mining Company was organised in Melbourne to work Eaton's Mallina Reef Claim. Early in the year a party of prospectors discovered alluvial gold on the Oakover River, and in a short time between 300ozs. and 400ozs. were gathered. In August a new field was discovered about 11 miles East of Roebourne by a Chinaman. The new find was called the Nickol field; it was not of great extent, and was situated so low and near the sea, that at high tide it was covered with water. At Nullagine many of the alluvial claims paid handsomely; at the 40-Mile over 700ozs. were taken out in a few days. During the year mills were erected by the Broken Reef Company at Pilbara, and the Alfred Argles Company at Mallina. Additional batteries were also put up at the Kimberley and Yilgarn fields.

1890. The Ashburton goldfield was proclaimed on the 11th December, 1890, and in May following, Mr. Thomas Wheatley was appointed Warden.

1891. The Murchison Goldfield was brought into notice by Mr. H. P. Woodward, the Government Geologist of the day, who described the country lying between the great bend of the Murchison and Milly Milly as being of an auriferous character. In the month of August, 1891, Mr. J. F. Connolly reported the discovery of alluvial about 200 miles East of the coast; this report was subsequently confirmed by Mr. W. Douglas. For the discovery of this field the Government awarded to Messrs. Connolly and Douglas £500 and £100, respectively.* Before the end of September between 300 and 400 men were scattered over this field, and some wonderful finds of alluvial gold were made. Nuggets were picked up ranging from 2oz. to 40oz.; in fact most of the gold was found either on the surface or at a very shallow depth.

The Murchison goldfield—headquarters at Nannine—was proclaimed on the 24th September. Mr. W. A. G. Walter was

*It has been claimed that Messrs. McPherson and Peterkin were the discoverers of the Nannine district field, and should have received the rewards.

Digitized by Google

appointed Warden. The Cue "field," covering a large extent of country, was discovered by Messrs. Cue and Fitzgerald, and the rich finds becoming known, it was not long before there were a number of men on the spot. The field proved exceptionally rich, and in a short time a large amount of gold was secured by "specking" and "dry-blowing." Rich gold-bearing reefs were found at various points throughout the district, notably at the "Island," in Lake Austin, where, in addition to rich quartz, a channel was found containing cement, from which for some time marvellous returns were obtained. The first discovery on the Yalgoo field was made in 1890, in the Nancarrong Hills, near the Yuin Station, where gold was found in a reef on a low range of hills five miles East of the station. From one place gold to the value of over £15,000 was dollied from the cap of the reef.

Messrs. Speakman and Ryan, in 1891, while on a prospecting trip North-East of Southern Cross, found good colours and gold-bearing quartz near what was afterwards known as Siberia.

Mr. Moir, while searching for grazing areas in 1889 or 1890, found a few colours of gold on the Dundas Hills. In 1892 he, with Mr. Stewart, organised a party, but they were not successful in finding gold in payable quantities. About the same time two or three other parties, attracted by the statement of Mr. Lindsay (the leader of the Elder exploring party in 1891), that he had crossed in his journey an auriferous belt between Fraser's Range and Southern Cross, set out for that section, and Messrs. Mawson, Kirkpatrick, Bromley, Mason, and others were fortunate enough to locate several promising reefs.

1892.

In the month of April, 1892, Messrs. Bayley and Ford, after selling the gold which they had secured at the Murchison, left Perth on a prospecting expedition. They proceeded to Mount Kenneth, about 250 miles to the North-East; here they lost their horses, and had to walk back to Newcastle, where they bought fresh ones, and again started with the intention of making for the Marring country, where gold had been found by Speakman the previous year, but they met "the fellows rushing back," who reported the place was very poor, and not worth spending any time in. After these discouraging reports Bayley and Ford headed for Southern Cross. Purchasing supplies enough to last seven or eight weeks they started Eastward on Hunt's old track—made in 1864-65—and after a tedious trip, when they were very near the now famous field, were forced to turn back to the Gnarlbine soak for water. After resting two days they started in a North-Easterly direction. They found the country so boggy that their progress was very slow; presently they reached the native well—Coolgardie—where they camped. Finding the place covered with grass they let the horses out to graze while they went specking across the flats. Here Ford picked up a half-ounce nugget, and before dinner time they found over 20oz. of gold. During the next three or four weeks they secured by specking and dry-blowing over 200oz. Their provisions giving out, they were forced to go back to

Digitized by Google

Southern Cross for a fresh supply. They were careful, however, not to say anything about the discovery they had made, but hurried back, and on the first Sunday afternoon after their return, while fossicking about, discovered the reef which soon became known all over the mining world; that evening they picked up and dollied with a tomahawk from the cap of the reef over 500oz. of gold, one slug weighing over 50oz., and early the next morning they pegged out a prospecting area on the reef. Shortly after Messrs. Foster and Baker, who had tracked them from Southern Cross, appeared upon the scene, and in a short time they secured over 200oz. Meantime, Bayley quickly made his way back to Southern Cross, carrying 554oz., which he exhibited to Warden Finnerty on the 17th of September, and applied for a lease of the discovery claim. The field was then declared open, and Bayley, on the 20th, again left Southern Cross for Coolgardie, not alone, but accompanied by a coach, by teams, and a host of horsemen, fully 150 in all, leaving Southern Cross almost deserted. The news quickly spread throughout the colony. The *West Australian* of 21st September said: "In Perth and Fremantle everyone seems to be either carrying tents, picks, shovels, and dishes, or otherwise preparing for the road." At York there was great excitement over the departure of over 200 eager gold-seekers; they travelled by coaches, teams, horses, camels, and on foot, all bound for the land of gold.

1893. Alluvial was discovered by Frost and party at Goongarrie (the 90-Mile) in May, 1893. About the same time gold was found at Lake Lefroy, "Mount Youle,"* and other districts.

Kalgoorlie (Hannan's) was discovered in June by Messrs. Flannigan and Hannan, who were on the road to Mount Youle with a party of about 150 men. They camped two days on or near the spot where the find was subsequently made, waiting for the teams which had gone back to Coolgardie for water; but rain falling, the party started on their way again, leaving Flannigan and Hannan behind. Flannigan, it appears, while looking for the horses, found a couple of nuggets, and induced Hannan to remain with him; in a few days they picked up over 100oz., and on the 17th of June Hannan went back to Coolgardie and applied for a reward claim, when immediately a rush set in, and in a few days fully 500 men were on the ground. A large amount of alluvial gold was quickly taken out, and many rich reefs discovered.

Bardoc (the 45-Mile) was located in August by Messrs. Cashman and Lee, who in a short time secured over 1,000oz.

The Dundas goldfield was proclaimed on the 31st August, and Mr. H. P. Woodward—the Government Geologist—appointed temporary Warden.

Siberia was discovered by Messrs. Frost and Bonner in October, and in the stampede which ensued to the new finds, after

* Supposed to be the present Mount Gledden.

Digitized by Google

they had applied for the reward claim, several lives were lost from heat and thirst; in fact, many started out on the long trip not half provided with food and water, who undoubtedly would have perished had it not been for the parties subsequently despatched, to their relief.

A bonus was offered by the Government, on the 11th January, 1893, to any person or company sinking a shaft on any proclaimed goldfield, during the year, from a depth previously attained of not less than 100 feet, as follows:—From 100 to 200 feet £2 10s. per foot, and from 200 to 300 feet, £5 per foot. At the close of the year no less than 11 companies applied for the reward, six of them at Yilgarn, one at Coolgardie, and four on the Murchison. A battery was erected on the "Star of the East" mine, near Nannine, early in the year, and preparations were made for placing additional machinery on mines at Cue, Mount Magnet, and other points on the Murchison field. A number of large nuggets were found at the Top Well, one weighing 298oz., and several over 100oz. each were brought into Cue.

In 1894 prospectors were scattered all over the Eastern goldfields, and many valuable discoveries were made. Messrs. Hall and Speakman discovered the Mount Jackson district. Rich alluvial was found at the Pinnacles in February, and in a short time over 1,000oz. were sent in to Coolgardie, while an equal amount arrived from Billy Billy, 90 miles to the Eastward.

1894.

The Yilgarn goldfield was subdivided on the 6th April into three fields, viz.:—Yilgarn, Coolgardie, and Dundas. Dr. V. Black was appointed Warden of the Yilgarn goldfield, Mr. J. M. Finnerty, of Coolgardie, and Mr. A. S. Hicks, of Dundas.

The Kanowna alluvial ground was discovered in 1894 by a digger known as "Old Tom," who took out some 40ozs.; the same ground was then worked by the Begg Brothers, who sank 3 feet and were fairly successful; then it was taken up as a reefing claim, which, after abandonment for 12 months or more, was early in the year 1897 registered by Messrs. Sim, Gresson, and Watt as an alluvial claim. The "lead" consisted of a deposit described as containing chiefly "red earth, iron stone, and iron grit," in a compact body about 3 feet deep, 2½ feet wide, and lying about 3 feet below the surface. The formation trended Westward, and as it was traced along in a winding course, it gradually dipped deeper into the earth. At a distance of 100 feet from the point of discovery the cement was 12 feet below the surface, and far richer in gold, the takings reaching on one occasion to 39oz. in a day. The success of Sim and Company becoming known, a rush set in, and in a short time a strip of country about a mile long was pegged off as alluvial claims.

Bulong (I.O.U.) was discovered in May by two hitherto unsuccessful prospectors, who were thinking of returning to Perth. One of them pointed out a gully near by where he had previously found colours; proceeding to the spot, in a short time they unearthed,

Digitized by Google

among others, a 70oz. nugget. Within a week the gully was pegged out from end to end, and over 500 miners were at work.

The Londonderry find was made in June by a prospecting party, consisting of Messrs. Carter, Dawson, Mills, Gardiner, Elliott and Huxley, who had been out many months without finding a colour, and were on their way back to Coolgardie; quite by accident rich quartz was picked up by two of the party, and after a brief search the outcrop of a reef was exposed, from which, during the first three or four days, they took out between 4,000 and 5,000oz. One specimen, "Big Ben," was estimated to contain gold to the value of £3,500 or more. On the 23rd June they applied for the reward claim, and deposited in the Bank at Coolgardie 4,280oz. of gold.

The Eastern Railway, from Northam to Southern Cross, was taken over by the Government and opened for traffic on the 1st July. The Northern line, reaching out towards the Murchison fields, was completed as far as Mullewa and taken over on the 1st November.

The Wealth of Nations was discovered in July by Mr. J. G. Dunn, an old prospector, representing a syndicate of well known West Australians. When only 28 miles from Coolgardie he found the outcrop of a reef. Upon breaking into the cap, the quartz appeared to be glittering with gold; one of the first pieces taken out contained fully 800oz. In a few days he secured gold to the value of over £20,000. In an incredibly short time after the lease was applied for, hundreds of men were upon the spot and several rich finds were made, two nuggets being secured, weighing respectively 197oz. and 147oz.

The Norseman Field was discovered in July by Mr. L. Sinclair.

The "Lady Shenton," at Menzies, was discovered in September by Messrs. Menzies and McDonald. On the outcrop they found many moss-covered specimens rich in gold, extending for more than 100 feet on the line of the reef.

On the 1st October the East Coolgardie goldfield was proclaimed, with headquarters at Kalgoorlie, Mr. M. H. Jephson being appointed Warden. Discoveries were made of valuable alluvial and reef claims during the year at the White Feather, Black Flag, Lake Lefroy, Broad Arrow, and Mount Margaret, on the Eastern fields; while at the same time the central fields were being opened up and mines developed at all points. Several rich discoveries were made. At Lake Darlôt over 2,000ozs. were dollied in a short time from the caps of the rich reefs, and at Lawlers and McCaffrey's rich alluvial rewarded the efforts of the prospectors.

The rapid development of the goldfields necessitated a change in the conduct of the office work at headquarters. On the 1st January, 1894, Mr. H. C. Prinsep had been appointed Under Secretary for Mines, and that department become a distinct branch of the Government Service, still, however, remaining under the supervision

Digitized by Google

of the Commissioner of Crown Lands. In December the office of Minister of Mines was created, and the Hon. E. H. Wittenoom, M.L.C., was appointed to the position.

1895. It was reported in January, 1895, that over 2,500 diggers were dry-blowing in the vicinity of Kalgoorlie. In February a valuable discovery was made at Niagara by Messrs. Northmore and Doolette. The Yalgoo goldfield—formerly part of the Murchison field—was proclaimed on the 23rd January. Mr. P. L. Gibbons was appointed Warden. The East Murchison goldfield was proclaimed on the 28th June, with Mr. A. G. Clifton as Warden. North Coolgardie was declared a goldfield on the same day, and Mr. F. Gill received the appointment of Warden.

Early in 1895 the "Hands Across the Sea" Reef claim was discovered at Kunanalling (the 25-Mile). The Hayes Brothers brought into Kalgoorlie 300lbs. of quartz, estimated to contain gold to the value of £3,000, from Kanowna. The Mount Catherine district was opened up about the same time, and later on in June there was a rush to the alluvial fields near Kunanalling. At the end of the year there were 11 batteries, one cyanide plant, and 12 other mills working in the Coolgardie district. At Cue there were 17 batteries, nine at Nannine, and two at Mount Magnet. Such was the rush for mining ground that at Kalgoorlie 700 leases were applied for in one month.

During the first half of the year 73 Western Australian Mining Companies were incorporated in London, capitalised at £7,743,000, not to mention the many companies which were organised and floated locally and in the Eastern colonies.

In 1895 a digger from Nullagine brought into Roebourne five small diamonds which he had found in the stamper boxes after a crushing. Mr. F. F. Groom, who visited this find, said: "The tracing of the conglomerate to the place where the rock was first formed would prove a very interesting study to a geologist, and might be found payable not only in working for diamonds, but for gold also, as these beds are gold yielding."

1896. The North-East Coolgardie goldfield was proclaimed on the 15th April, 1896. Mr. P. Fielding was appointed Warden. The railway from Southern Cross was taken over and formally opened by His Excellency Sir Gerard Smith on the 23rd of March, 1896, and the Kalgoorlie line was opened on the 8th September of the same year.

1897. Mr. F. T. Daniel, in the early part of September, 1897, discovered, about 25 miles North of Newcastle, gold in the Blackboy Hill district; up to the end of the year upwards of 60 claims were pegged out; samples of quartz assaying 7oz. to the ton are said to have been taken from a trial shaft.

In September, the Warden reported that 170 claims had been recorded on the "deep leads" of Kanowna, and that fully 70 were yielding payable gold.

Digitized by Google

On the 23rd of December, the Mining on Private Property Act became law.

At Lake Way, on the 29th December, a digger named Martin unearthed a nugget weighing 463oz., the largest yet found in the Colony.

For the purpose of stimulating the production of asbestos, a bonus was offered by the Government to any person who would export 50 tons of asbestos, at an export value of not less than £10 per ton. The total amount of bonus not to exceed £500.

1898. On the 20th January, 1898, the Government offered a reward of £500 to the person first discovering alluvial gold at a depth below 30 feet from the surface on any land situated not less than six miles from any known deep alluvial workings, giving the finder also the right to select four ordinary alluvial claims at the point of discovery; the reward to be paid as soon as 1,000 ounces of gold were obtained from the discovery.

With the view of furthering the mica industry, the Government, on the 28th March, offered a bonus to any person who should obtain, within three months from that date, from any district as defined in the proclamation setting forth these conditions, and export mica in a quantity of not less than two tons, which should realise at least 1s. 6d. per lb: Ten shillings for every £1 sterling realised on sales at from 1s. 6d. to 10s. per lb.; and £1 for every £1 sterling realised on sales at upwards of 10s. per lb.

The Donnybrook district was discovered by Messrs. Bourke and Hunter in the latter part of 1898. Mr. T. Blatchford, Assistant Geologist, says: "Donnybrook is situated on the Bunbury to Bridgetown railway, and is 26 miles South-East of Bunbury and 143 miles from Fremantle by rail. The scene of the mining operations is some two miles to the South of the Donnybrook townsite, on a small branch of the Preston River, in the Blackwood Range. Gold was first discovered in the surface soil by a party searching for alluvial gold. Further investigations carried on with the prospecting dish eventually led to the discovery of auriferous quartz veins, from which most of the alluvial gold had originally been shed. The country, which is extremely hilly and thickly timbered, is for the most part covered with ironstone gravel deposits. Besides these workings on reefs, several of the miners have given their attention to the finding of alluvial gold. Dishes of dirt taken from the surface of the hills will usually yield a trace of gold when washed, and in some places a fair result is obtained."

In December, "the rich alluvial finds at Kanowna were keeping not only the local batteries, but many of the Kalgoorlie, Boulder, and Northam stampers at work." Five distinct leads were worked for a considerable length of time, and yielded handsome returns, viz.: The North, the South, the Fitzroy, the Q.E.D., and Golden Valley; while other alluvial workings at Wilson's Gully, All

Digitized by Google

Nations, Kangaroo Gully, Golden Cement, and Salvation Flat paid very well.

At Bulong paying alluvial claims were worked at the Melbourne United Gully, on the Margaret, the Oversight, and the Maggie leads; slugs and nuggets weighing up to 48oz. were taken out.

At Broad Arrow coarse gold was found in most of the gullies.

A number of miners were working on the cement leads at Paddington, in ground from 80 to 100 feet in depth.

At Sunday Gully, in the Mount Margaret district, good returns were obtained by the diggers.

At Coolgardie, in the latter part of the year 1898, alluvial gold was discovered about four miles from the town, on Block 48 of the Hampton Plains Estate, by an Italian named Armanesco, and, as a result, a number of miners were soon engaged all over the field in search of alluvial, with a fair degree of success.

At Mount Magnet good wash dirt was found at a depth of 25 feet, and coarse nuggets up to 18dwt. were obtained. In the Murchison goldfield, at Poverty Flat, slugs up to 80oz. in weight were found.

1899. Traces of *gold* had been found at Donnybrook by Mr. R. L. Hunter, in 1898; but in 1899 a rich reef was discovered in "Jackson's Claim," and as a consequence many leases were taken up, and the Donnybrook goldfield proclaimed on the 27th November.

Copper had previously been known to occur on the Phillips River; but in 1899 several gold reefs and copper lodes were opened up, and the Phillips River Mining District proclaimed on the 1st July.

Tin was discovered in April, 1899, in several creeks to the East of Marble Bar, 57 tons being won in that year. This area, known as the Moolyella Tinfield, has since developed into a field of some importance.

The Anaconda *Copper* Mine, the most important in the State, was discovered in 1898, but first opened up in this year, resulting in the discovery of extensive deposits of copper ore. It is situated three miles South-West of Murrin Murrin.

Iron ore was first mined in the State in this year, 13,000 tons being raised at Clackline and elsewhere on the Darling Ranges for use at the Fremantle Smelting Works.

Cobalt ore was first discovered at Kanowna, in the North Lead.

Silver-lead ore and *silver-copper ore* were discovered in several parts of the Ashburton watershed. The deposits at Uaroo station were of most importance in this vicinity.

Several large *alluvial nuggets* were discovered this year. The "Bobby Dazzler," the largest ever found in the State, 487oz. gross, 413oz. net, was discovered by Clive, at Sharks Gully, Pilbara goldfield. The "General Gordon," the second largest ever found in the State, 372oz. gross, 331oz. net, by McPhee Brothers, also at

Digitized by Google

Sharks Gully. J. Simmonds' nugget of 168oz., at Mulgabbie, North-East Coolgardie. Also several others over 100oz. Merton's Reward mine was discovered in March, by E. Merton; 1,000 tons of the outcrop yielded 3,307oz. A considerable amount of mining is now done at "Mertondale," as the locality is named.

A *deep lead* was discovered at Paddington, which yielded a very large amount of gold, and gave employment to a great number of men. Some extremely rich surface shows were discovered at Mount Weld (Burtville), in the Mount Margaret goldfield.

Very rich *alluvial deposits* were found at Taurus and Hogan's Find, North-East Coolgardie, the latter yielding a number of nuggets of considerable size.

A large belt of *auriferous country* was discovered to the East of Marble Bar, Pilbara, embracing the 20-Mile, Sandy Creek, Mosquito, Elsie Creek, and Cooke's Creek.

Rich *gold* was discovered at Lallarookh, Pilbara.

1900. *Alluvial tin ore* was discovered on Cooglegong Creek, 45 miles South-West of Marble Bar.

Gold was discovered at Yundamindera and Mount Higgins (Mulwarrie), North Coolgardie; Wilgeena (Wilson's Find), Peak Hill; Ninghan, Yalgoo; Preston River, South-West; Boodalyerrie Creek, Pilbara; Wadgingarra, Yalgoo; Yellowdine, and Duladgin, Yilgarn.

Freestone of good quality for building purposes was discovered at Donnybrook, and several quarries opened up.

Large deposits of *rich ore* were discovered at some depth in the Great Fingall mine, Day Dawn, leading to an extensive development in that mine, and a revival generally throughout the district.

Gold was discovered at Carwell, Reedy's, and Weld Range, Murchison; also at Davyhurst, North Coolgardie.

A large *nugget* weighing 197oz. was discovered at Kurnalpi by William Eddy in October.

A rich *gold* find was made at Black Hills, North-East Coolgardie, 2,000oz. being taken out in a short time.

The Phillips River goldfield was proclaimed on 14th September.

1901. A new find of *gold* was made 15 miles from Kalgoorlie, and three miles South of Boorara.

The discovery of a *deep lead* was reported in the Princess Royal district, Dundas goldfield, in February.

Mr. H. P. Woodward, the consulting geologist, reported favourably on the Phillips River goldfield.

In consequence of the reported rich discoveries of *silver*, *lead*, and *copper* at Uaroo, 84 miles from Onslow, the boundaries of the Ashburton goldfield were extended on the 14th October, 1901.

Digitized by Google

PART II.—DESCRIPTIVE.

1.—PHYSICAL FEATURES.

(Revised by Fred S. Brockman, Esq., Chief Inspecting Surveyor.)

The State of Western Australia embraces all that portion of the Continent of Australia and the adjacent islands lying to the West of the 129th meridian, and is bounded on the North, West, and South by the sea, its Western, North-Western, and Northern coast-lines being washed by the Indian Ocean, and the Southern coast by the Great Southern Ocean.

Coast-Line.—The coast-line to the North of the 18th parallel of latitude is deeply indented by gulfs and bays, whereas the whole of the coast South from that parallel is marked by long, straight stretches, little broken by inlets. The total coast-line is, therefore, remarkably short, as compared to the immense size of the State.

The coast of the Southern and South-Western portions of the State is rising rapidly, which accounts for the low alluvial and sandy plains existing in places between the sea and the coastal ranges. These plains vary from a few hundred yards to 20 miles in width, and are interspersed with numerous small inlets, salt lakes, and swamps.

Tides.—As might be expected on this great length of coast lying within both the temperate and tropical zones, there are very varied rises and falls of the tide. On the South and South-West coasts, and as far North as Shark Bay, the differences between high and low water points are very small. About the latitude of Fremantle these differences are practically dependent solely on the prevailing breezes, and not to any direct tidal effect. From Shark Bay Northwards, the tides rapidly increase in range, although this increase is by no means uniform, being, apparently, largely influenced by the aspect that the various portions of the coast present to the ocean swell. Some of the differences between high and low water marks are: at Cossack, 18 feet; at Roebuck Bay, 30 feet; at King Sound, 46 feet; and at Cambridge Gulf about 28 feet at spring tides. At many intermediate points the tides differ very greatly from those recorded at the ports at present in use. It was recently found that spring tides at Napier Broome Bay, only gave a difference between high and low water marks of 11 feet, whilst in the adjoining inlet (Vansittart Bay) this difference is at least 30 feet.

Bays, Gulfs, etc.—The principal inlets, beginning from the North, are: Cambridge Gulf, Napier Broome Bay, Vansittart Bay, Admiralty Gulf, Montague Sound, York Sound, Brunswick Bay, Camden Sound, Collier Bay, King Sound, Beagle Bay, Roebuck Bay, La Grange Bay, Port Walcott, Nickol Bay, Exmouth Gulf, Shark Bay, Champion Bay, Cockburn Sound,

Digitized by Google

Koombana Bay, Geographe Bay, Flinders Bay, King George Sound, Bremer Bay, and Esperance Bay. With the exception of Princess Royal Harbour (the inner Harbour of King George Sound) the principal anchorages used to the South of the 19th parallel of latitude are open roadsteads, which, as a rule, are only partially protected; but the holding grounds of these are fairly good, and accidents seldom happen to vessels properly found; whilst fine harbours have been artificially provided at Fremantle, near Cockburn Sound, and at Bunbury in Koombana Bay.

Capes.—The principal Capes are: Capes Domett and Dussejour, at the entrance of Cambridge Gulf; Cape Londonderry, which is the most Northerly point of the State; Cape Talbot; Cape Bougainville, lying between Admiralty Gulf and Vansittart Bay; Cape Voltaire, which is the Western boundary of Admiralty Gulf; Cape Torrens, at the entrance to York Sound; Cape Lévêque, the Southern boundary of King Sound; Sloping Head, to the West of Nickol Bay, well-known to the Roebourne pearlers; North-West Cape, which forms the Western boundary of Exmouth Gulf; Cape Peron, in Shark Bay; Steep Point, situated on the Southern entrance to Shark Bay, which is the most Westerly point of the Continent; Capes Naturaliste and Leeuwin at the South-Western extremity of the Continent, and Point D'Entrecasteaux, West Cape Howe, Peak Head, Hood Point, Cape le Grande, and Cape Arid on the Southern Coast.

Islands.—The Northern coast between Capes Lévêque and Londonderry is fringed with numberless islands. Some of these are of considerable area, amongst the largest being Augustus Island, near Camden Sound, and Bigge Island, to the North of York Sound. Very few of these islands have been closely examined, but, as seen from the sea, they appear to be principally of sandstone formation, and are probably of the same rugged nature as the sandstone area of the neighbouring coast-line. Abreast of the coast North-Easterly from North-West Cape there are also large numbers of islands, consisting of those known as Dampier's Archipelago, Barrow Island, and some others. These are principally of granitic formation, and some of them are fairly well grassed. Amongst the other important islands off the coast are Dirk Hartogs, Dorre (*Barren*), Bernier, and Babbage Islands in Shark Bay, and the Houtman Abrolhos, off Champion Bay, on which deposits of guano have been found. This valuable fertiliser has also been obtained from the Lacepede Islands, and is found on some other small islands amongst the northern groups. On the South-West coast the only islands of importance are Rottnest and Garden Islands, off Fremantle; and off the Southern coast, between Esperance Bay and Point Dempster, the great cluster of small islands known as the Archipelago of the Recherche.

Mountains.—The mountains are not remarkable for their height, though many of them, rising abruptly from low-lying plains, present a striking appearance. Beginning at the North, the *principal* ranges of the Kimberley District are: The Princess May

Digitized by Google

Range, stretching South-Easterly from York Sound, in which the highest point is Mount York, probably reaching an altitude above 3,000 feet, although the highest point of this range of which the altitude has been accurately obtained is Mount Hann, with an altitude of 2,800 feet; to the South of this the King Leopold Range stretches South-Easterly from the shores of Collier Bay, which, although very boldly defined on the Southern side, nowhere reaches an altitude exceeding 2,400 feet. Of the North-Western portion of the State the highest range is the Hamersley, lying between the Fortescue and Ashburton Rivers. Mount Bruce, in this range (the highest known point in the State), reaches an altitude of 3,800 feet. In the South-West, the most important range is the Darling, which stretches in a nearly due North and South line from Yatheroo at its Northern extremity to Point D'Entrecasteaux on the South coast. This range lies parallel to, and from 18 to 20 miles distant from, the Western sea-board, and is the most important range in the State by reason of its effect on the climatic conditions of the most closely settled area. The highest point in this range is Mount William in the Murray District, which has an altitude of about 1,700 feet. The Stirling Range, situated about 40 miles to the North-East of Albany, is the loftiest range in the Southern portion of the State, and, being perfectly isolated and rising abruptly from a low-lying coastal plain, is visible for a great distance. The highest point in this range is Mount Toolbrunup, which reaches an altitude of a little over 3,000 feet. No active volcanoes exist, but the craters of several extinct ones are reported to have been discovered in the North-West and in the Kimberley District in the neighbourhood of the 16th parallel of latitude. The appearance of the whole of the country, with perhaps the exception of some parts of the Kimberley District, indicates a condition of remarkable quiescence as far back as the carboniferous epoch.

Rivers.—The principal rivers are: in the North, the Ord, with its tributaries, the Denham, Bow, Negri, and Panton; the Pentecost, with its tributary, the Chamberlain; the Durack, Drysdale, King Edward, Prince Regent, Charnley, Isdell; and the Fitzroy, with its tributaries, the Margaret River and Christmas Creek. In the North-West the De Grey, with its tributaries the Oakover, Shaw, and Strelley; the Yule, the Fortescue, and the Ashburton, with its tributaries, the Henry and Hardy. Then, falling to the Western coast, the Gascoyne, with its tributary, the Lyons; the Murchison, with its tributary, the Sanford; the Greenough, the Swan, on which is situated the capital of the State, and which, above tidal waters, is called the Avon; the Murray, the Collie, and the Preston. And lastly, on the Southern coast, the Blackwood, Warren, Kalgan, and Phillips Rivers.

Lakes.—There are no lakes of any considerable importance in the State. Between the Darling Range and the coast there are a few salt-water lagoons, and many small fresh-water lakes, the majority of which are nothing more than swamps during the dry season, and none of them are of any economic importance. The

Digitized by Google

so-called lakes in the interior of the State, which are frequently of very considerable area, are, except after the occasional heavy rains, merely immense salt marshes or clay pans.

Contour of the Country.—That part of the State lying to the North of the 19th parallel of latitude may be described as mountainous, consisting of alternating high and lower lying plateaux; the highest country here is principally of sandstone formation. The North-West Division and much of the Gascoyne Division is a distinctly mountainous country, the ranges here being principally granitic. A large proportion of the South-Western and Southern sea-boards is of flat sandy character, with indications of a recent geological formation, and may be described as a vast forest, principally timbered with jarrah, white and red gums, and karri, most of which timbers are of great commercial value. From some points on the Western sea-board settlement has now extended for about 600 miles inland, but, from very complete information furnished by explorers and prospectors, it is apparent that no considerable portion of the interior lying between the 19th and 31st parallels of latitude and between the 121st and 129th meridians of longitude is suitable for any class of settlement except in connection with the development of the mineral resources. This area may be described as a great table-land, with an altitude of from one to two thousand feet above sea level, the surface of which consists largely of sand dunes, though in many parts of it there are large areas of clayey soils. Between the 30th parallel of latitude and the Great Australian Bight, much of the country is of limestone formation, and here there are immense areas of grass land, which only await the discovery of subterranean water to make them amongst the most productive areas of the State.

2.—GEOGRAPHY.

Position.—Western Australia, as defined by Her Majesty's Commission, dated 10th July, 1873, includes all that portion of the Australian Continent "extending from the parallel of thirteen "degrees thirty minutes South latitude to West Cape Howe, in "the parallel of thirty-five degrees eight minutes South latitude, "and from Dirk Hartogs Island, on the Western coast, in longitude "one hundred and twelve degrees fifty-two minutes, to one hundred "and twenty-nine degrees of East longitude, reckoning from the "meridian of Greenwich, including all the islands adjacent in the "Indian and Southern Oceans, within the latitudes aforesaid of "thirteen degrees thirty minutes South, and thirty-five degrees "eight minutes South, and within the longitudes aforesaid of one "hundred and twelve degrees fifty-two minutes, and one hundred "and twenty-nine degrees East, from the said meridian of Green-"*wich.*"

Digitized by Google

Area.—The greatest length of this territory, from Cape Londonderry in the North to Peak Head (South of King George Sound) in the South, is 1,480 miles, and its breadth from Steep Point, near Dirk Hartogs Island, on the West, to the 129th meridian, on the East, about 1,000 miles, containing, according to the latest computations, an area of 975,920 square miles, or 624,588,800 acres.

The length of the coast-line, following known indents, is estimated to be approximately 5,200 miles.

The following facts will assist in forming an idea of the magnitude of this area. The figures relating to foreign countries are taken from the "Statesman's Year Book" for 1901. As a whole, the Continent of Australia is estimated to contain 2,946,691 square miles, and Western Australia, therefore, occupies nearly one-third of the Continent, being about equal in size to all the following European States if joined together:—

	Square miles.
Germany	208,830
France	204,092
Hungary	125,039
Norway	124,445
United Kingdom	120,979
Austria	115,903
Portugal (Mainland)	34,528
Switzerland	15,976
Denmark (including Faroe Is.) ...	14,795
Belgium	11,373
Total	975,960 sq. miles

The area of the whole of Europe is 3,823,197 square miles, whilst the grand total of the British Dominions and Protectorates is 11,288,277 square miles, with a population of 395,152,105.

Not many years ago the occupied portion of the State was comprised in an area of about 1,200 miles in length, by about 150 in average breadth, lying between Albany (King George Sound) in the South, and Wyndham (Cambridge Gulf) in the East Kimberley District, in the North; namely, between the 15th and 35th parallels of South latitude. However, since the discovery and exploration of the Central and Eastern Districts Goldfields, vast tracts of country once entirely unknown have been opened up and occupied far in the interior, and at present flourishing mining townships exist from 400 to 500 miles inland.

(For Land Divisions and Sub-divisions, see Volume II.)

Digitized by Google

The Following is a List of Declared Townsites:—

Name.	When declared.	Lat. S.		Long E.	
		°	′	°	′
Abbotts	3rd August, 1900	27	30	120	36
Albany	*July, 1841	35	2	117	54
Augusta	11th May, 1830	33	40	115	10
Austin	31st May, 1895	27	38	117	51
Balagundi	28th August, 1896	30	44	121	41
Balgarri	18th February, 1898	30	30	121	7
Balingup	17th June, 1898	33	46	115	59
Balla Balla	8th July, 1898	20	42	117	45
Bamboo	14th June, 1895	20	55	120	14
Bardoc	5th June, 1896	30	20	121	17
Bejoording	29th September, 1899	31	22	116	37
Beverley	*1830	32	7	116	51
Black Flag	2nd July, 1897	30	33	121	13
Bonnie Vale	13th August, 1897	30	51	121	11
Boogardie	28th January, 1893	28	2	117	46
Boorabbin	22nd July, 1893	31	12	120	20
Boorara	10th December, 1897	30	49	121	39
Boulder	4th December, 1896	30	47	121	30
Boyanup	12th October, 1894	33	28	115	43
Boyup	9th February, 1900	33	49	116	23
Bridgetown	4th June, 1868	33	57	116	8
Broad Arrow	18th September, 1896	30	27	121	29
Brookton, see Seabrook		32	22	117	1
Broome	27th November, 1883	17	57	122	15
Broome Hill	28th May, 1897	33	49	117	37
Bulla Bulling	18th March, 1898	31	1	120	54
Bulong	29th November, 1895	30	46	121	47
Bunbury	*February, 1841	33	18	115	38
Burbanks	15th October, 1897	31	3	121	9
Burracoppin	19th March, 1891	31	24	118	30
Busselton	*June, 1837	33	39	115	21
Callion	27th August, 1897	30	7	120	35
Capel	9th July, 1897	33	32	115	34
Carnarvon	23rd January, 1883	24	42	113	39
Chidlow's Well	27th November, 1883	31	52	116	16
Clackline	13th August, 1897	31	43	116	32
Cleaverville	22nd December, 1892	20	39	117	0
Collie	3rd December, 1897	33	21	116	8
Cookernup	7th September, 1894	32	59	115	54
Coolgardie	24th August, 1893	30	57	121	10
Coolup	3rd February, 1899	32	46	115	52
Cossack	25th May, 1872	20	40	117	8
Cranbrook (W.A. Land Company)	3rd February, 1899	34	16	117	32
Cuballing (do.)	3rd February, 1899	32	47	117	9
Cuddingwarra	13th December, 1895	27	22	117	46
Cue	17th August, 1893	27	25	117	52
Day Dawn	25th May, 1894	27	27	117	50
Denham	6th May, 1898	25	45	113	21
Denison	†	29	16	114	56
Derby	27th November, 1883	17	18	123	40
Dongara	*1852	29	17	114	53
Donnybrook	12th October, 1894	33	33	115	48
Doodlekine	19th March, 1891	31	35	117	52
Drakesbrook	22nd March, 1895	32	52	115	55
Dundas	24th May, 1895	32	23	121	47
Dunnsborough	29th April, 1879	33	34	115	5
Dunnsville	17th December, 1897	30	38	120	53
Esperance	15th December, 1893	33	51	121	50
Eucla	12th November, 1885	31	42	128	53
Feysville	8th July, 1898	30	58	121	37
Fremantle	‡	32	3	115	45
Gabanintha	18th November, 1898	26	55	118	36
Geraldton		28	46	114	36
Gingin	12th December, 1871	31	13	115	47
Gladstone	19th March, 1891	25	45	114	15
Gledhow	11th March, 1898	35	2	117	51
Goongarrie	14th June, 1895	30	3	121	9
Gordon	8th October, 1897	30	27	121	36

* Townsite surveyed. † No record. ‡ No record; first town lots sold 5th September, 1829. ‖ No record; first town lots sold June, 1850.

Digitized by Google

List of Declared Townsites—continued.

Name.	When declared.	Lat. S. °	Lat. S. ′	Long. E. °	Long. E. ′
Granville	31st August, 1869	31	13	115	45
Grass Valley	9th September, 1898	31	39	116	47
Greenbushes	3rd November, 1899	33	50	116	3
Greenbushes, North	26th May, 1899	33	49	116	3
Guildford	*	31	53	116	1
Gullewa	14th January, 1898	28	39	116	21
Hall's Creek	23rd November, 1894	18	15	127	46
Hamel	3rd February, 1899	32	54	115	55
Hester	18th August, 1899	33	54	116	9
Hopetoun	15th February, 1901	33	37	120	8
Horseshoe	22nd February, 1901	25	27	118	35
Jackson	5th March, 1897	30	12	119	8
Kalamunda	13th December, 1901	31	58	115	52
Kalgoorlie	7th September, 1894	30	45	121	30
Kambalda	10th December, 1897	31	10	121	15
Kanowna	14th December, 1894	30	37	121	36
Katanning	16th May, 1898	33	38	117	31
Keimscott	†June, 1831	32	7	116	2
Kintore	12th November, 1897	30	36	121	2
Kirupp	27th September, 1901	33	42	115	53
Kauralford	26th September, 1889	30	55	119	2
Kojonup	4th May, 1900	33	50	117	9
Kookynie	19th January, 1900	29	20	121	26
Kunanalling	5th June, 1896	30	41	121	5
Kundana	24th September, 1897	30	42	121	15
Karnalpi	25th January, 1895	30	32	122	15
Kurrajong	16th June, 1899	28	42	121	6
Laverton	6th July, 1900	28	38	122	24
Lawlers	24th July, 1896	28	5	120	12
Lennonville	30th September, 1898	27	58	117	49
Leonora	15th April, 1898	28	53	121	20
Linden	29th January, 1897	29	19	122	26
Londonderry	30th August, 1895	31	5	121	8
Lynton	1st March, 1854	28	12	114	18
Mainland	10th June, 1898	27	35	117	54
Malcolm	10th September, 1897	28	56	121	31
Mallina	28th February, 1896	20	52	118	13
Marbelup	24th August, 1900	35	0	117	44
Marble Bar	13th July, 1893	21	11	119	42
Meckering	6th December, 1895	31	36	117	3
Melville	1st May, 1890	(See Noongal)			
Menzies	16th August, 1895	29	41	121	2
Merriden	19th March, 1891	31	28	118	18
Mertondale	28th June, 1899	28	40	121	32
Moojebing	4th February, 1892	33	35	117	26
Moora	12th April, 1895	30	37	116	0
Moorumbine	24th April, 1884	32	32	117	9
Mt. Barker	20th January, 1899	34	36	117	39
Mt. Ida	6th May, 1898	29	3	120	30
Mt. Magnet	18th January, 1895	28	3	117	49
Mt. Margaret	14th May, 1897	28	49	122	10
Mt. Morgans	15th December, 1899	28	46	122	4
Mulgarrie	8th October, 1897	30	23	121	31
Mullalyup	15th March, 1901	33	44	115	56
Mullewa	13th July, 1894	28	33	115	31
Mulline	22nd October, 1897	29	47	120	32
Mulwarrie	14th September, 1900	29	59	120	33
Mundaring	20th May, 1898	31	54	116	10
Mundijong	22nd December, 1893	32	17	116	0
Murrin Murrin	16th February, 1900	28	56	121	49
Nannine	20th April, 1893	26	53	118	19
Nannup	9th January, 1890	33	59	115	45
Narrogin	4th June, 1897	32	54	117	9
Newcastle	1st October, 1860	31	34	116	27
Niagara	27th November, 1896	29	22	121	24
Noongal	17th December, 1897	27	50	116	47
Norseman	24th May, 1895	33	11	121	47
Northam	†1833	31	40	116	40
Northampton	19th February, 1864	28	22	114	37
Nullagine	15th September, 1899	21	54	120	4
Onslow	29th October, 1895	21	42	114	57
Paddington	5th February, 1897	30	29	121	20
Pakington	*1st March, 1854*	28	13	114	13
Parker's Range	‡	31	39	119	35

* *No record; first lot sold September, 1890.* † Townsite surveyed. ‡ No rec

Digitized by Google

List of Declared Townsites—continued.

Name.	When declared.	Lat. S. °	Lat. S. ′	Long. E. °	Long. E. ′
Parkerville ...	30th November, 1900 ...	31	53	116	7
Paynesville ...	9th March, 1900 ...	28	1	118	29
Peak Hill ...	26th November, 1897 ...	25	39	118	42
Perth ...	†12th August, 1829 ...	31	57	115	50
Pindar ...	22nd February, 1901 ...	28	29	115	48
Pingelly ...	4th February, 1898 ...	32	32	117	5
Pinjarra ...	30th September, 1898 ...	32	37	115	35
Pinwernying ...	4th February, 1892 ...	33	39	117	31
Porlell ...	17th November, 1899 ...	26	56	118	35
Port Hedland ...	23rd October, 1896 ...	20	19	118	34
Preston ...	15th December, 1899 ...	33	31	116	0
Puntaping ...	13th April, 1893 ...	33	18	117	20
Quindalup ...	17th November, 1899 ...	33	40	115	9
Ravensthorpe ...	18th January, 1901 ...	33	35	120	3
Rockingham ...	3rd June, 1847 ...	32	16	115	45
Roebourne ...	17th August, 1866 ...	20	46	117	8
Rothesay ...	18th November, 1898 ...	29	17	116	54
Sawyers' Valley ...	28th October, 1898 ...	31	54	116	12
Seabrook (now Brookton) ...	18th January, 1895 ...	32	22	117	1
Serpentine ...	22nd December, 1893 ...	32	21	115	59
Shellborough ...	25th January, 1895 ...	20	1	119	38
Sir Samuel ...	14th May, 1897 ...	27	37	120	33
Southern Cross ...	20th March, 1890 ...	31	14	119	21
Tampa ...	5th February, 1897 ...	29	13	121	24
Tambellup ...	16th February, 1900 ...	34	1	117	39
Tammin ...	26th May, 1899 ...	31	37	117	29
Tenterden ...	27th April, 1893 ...	34	21	117	33
Toodyay ...	‡1833 ...	31	31	116	21
Trafalgar ...	27th September, 1901 ...	30	47	121	31
Tuckanarra ...	17th February, 1899 ...	27	7	118	3
Wagin ...	16th May, 1898 ...	33	18	117	20
Wagerup ...	6th June, 1899 ...	32	58	115	54
Walliabup ...	20th January, 1899 ...	32	5	115	51
Waverley ...	14th October, 1898 ...	30	14	120	58
Widgiemooltha ...	3rd December, 1897 ...	31	29	121	35
Williams ...	8th October, 1897 ...	32	59	116	51
Wiluna ...	15th April, 1898 ...	26	37	120	20
Windanya ...	1st October, 1897 ...	30	22	121	16
Wonnerup ...	16th July, 1856 ...	33	37	115	24
Woodanilling ...	4th February, 1892 ...	33	33	117	25
Woodarra ...	14th January, 1898 ...	27	56	121	18
Wyndham ...	2nd September, 1886 ...	15	27	128	5
Yalgoo ...	24th January, 1896 ...	28	23	116	43
Yerilla ...	13th August, 1897 ...	29	29	121	35
York ...	‖ ...	31	53	116	47
Youndegin ...	1st September, 1892 ...	31	47	117	19
Yundurup ...	6th May, 1898 ...	32	33	115	47
Yundamindera (The Granites) ...	14th June, 1901 ...	29	7	122	2

† The first stone laid. ‡ Townsite surveyed ‖ No record; first town lot sold July, 1835.

Latitudes and Longitudes of the Capitals of the Australasian States.

State or Colony.	Capital City. Name.	Latitude S. °	′	″	Longitude E. °	′	″
Victoria ...	Melbourne ...	37	49	53	144	58	32
New South Wales ...	Sydney ...	33	51	41	151	12	23
Queensland ...	Brisbane ...	27	28	0	153	1	36
South Australia ...	Adelaide ...	34	55	34	138	35	4
Western Australia ...	Perth ...	31	57	10	115	50	26
Tasmania ...	Hobart ...	42	53	25	147	19	57
New Zealand ...	Wellington ...	41	16	25	174	46	38

Digitized by Google

3.—THE SALIENT GEOLOGICAL FEATURES OF WESTERN AUSTRALIA.

(*By A. Gibb Maitland, Esq., Government Geologist.*)

INTRODUCTION.

This account of the salient geological features of Western Australia must be regarded more in the light of a statement of the present condition of our knowledge than a detailed description thereof, and should serve to show how much has yet to be learnt on the subject.

Certain very small portions of the State which are of economic importance have in late years received somewhat detailed investigation, but there are many portions which are as yet only imperfectly known, while by far the larger area of Western Australia has never yet been examined by any trained geologist, and many years must elapse before even the dominant geological features can be grasped.

In the compilation of this account I have freely availed myself of the work of my predecessors and of those other workers to whom Western Australian geologists owe a debt of gratitude. As this article is to a large extent based upon the labours of previous official geologists, it is not out of place to give a succinct account of their observations.

Dr. F. von Sommer would appear to have been the first official geologist employed in the State. This gentleman travelled extensively during the years 1847 to 1857 throughout Western Australia. He geologically examined the Victoria, Toodyay, and York Districts, and extended his observations to the country lying between the latter and Mt. Barren, on the South Coast. Neither the maps nor reports of this worker have ever been published, although three articles from his pen bearing upon the geology of the State appeared in the pages of current literature during the years 1848 to 1849.* After an interval of 21 years, during which much excellent geological work was accomplished by the Gregory Brothers, Mr. H. Y. L. Brown was appointed to the post of Government Geologist. This officer, during the years 1870-71, prepared three geological maps and issued ten reports (now out of print), all of which have been laid under contribution in the preparation of this *résumé*. In 1882 Mr. E. T. Hardman, of the Geological Survey of Ireland, was appointed Government Geologist. His labours were chiefly confined to the Kimberley District, upon which he issued two voluminous reports illustrated with a series of maps and plates. Mr. Hardman's researches laid the foundations of our knowledge of the geology of the Northern portion of Western Australia, and also led to the discovery of the Kimberley Goldfield. This officer

* *Vide* "Bibliography of the Geology of Western Australia." A. Gibb Maitland, Perth: By Authority, 1889.

Digitized by Google

examined the neighbourhood of Bunbury, Blackwood, etc., and investigated the vicinity of Perth with reference to the question of its water supply from subterranean sources Mr. Hardman concluded that it was hopeless to expect an overflowing supply of water anywhere in the neighbourhood of the capital. This conclusion, though not borne out by recent trials, was the only one which could be legitimately arrived at so long as it was assumed that the water-carrying strata must be arranged in the form of one of those ideal basins, sections of which have done duty for many years in geological manuals Recent observations have shown that this condition rarely obtains in Nature, and that in all the important artesian areas the porous beds are so arranged that there is only one side of a synclinal trough present. The late Rev. C. G. Nicolay contributed largely to our knowledge of the geology of the State, and was the founder of the Geological Museum in Fremantle, now merged into the Western Australian Museum. In 1887 Mr. H. P. Woodward was selected to fill the post of Government Geologist. Mr. Woodward, in the course of his official duties (1887-1895), travelled over the length and breadth of the State, and, with a small appropriation, published 21 voluminous reports and six geological maps.

Archæan Rocks.

The oldest formation in Western Australia is that comprising those gneissic, granitoid, and schistose rocks, which cover such an enormous area of country, and form the floor upon which the newer strata have been laid down. To the whole of these metamorphic rocks observers have invariably assigned an Archæan Age; this, however, is more inferred than proved. There is only one instance on record, at the present time, upon which this classification may be considered to have been determined by palæontological evidence.

In the Kimberley District certain limestones, sandstones, quartzites, etc., have yielded Lower Cambrian fossils, viz., *Salterella Hardmani* and *Olenellus* (?) *Forresti*. These fossiliferous beds are considered, and may probably be, newer than the gneissic and schistose rocks in the vicinity. So far as observations have at present been carried, no actual junction has been noticed between the schists and the fossiliferous strata, and there is nothing already in the evidence available incompatible with the supposition that the talcose and mica schists and other associated rocks represent much more highly metamorphosed portions of the Lower Cambrian beds.

In the absence of direct stratigraphical or palæontological evidence, it is convenient, for descriptive purposes, to adhere to a purely lithological classification, and to separate the gneissic, granitoid, and schistose rocks from those in which metamorphism has not been carried sufficiently far to entirely obliterate their clastic character.

Digitized by Google

These Archæan rocks have been thus described by Mr. H. P. Woodward, formerly Government Geologist:-

This great group of rocks are more largely developed in this Colony than in any other portion of the world, outcropping as they do in all parts of the country, and where they are overlain by more modern formations these latter are rarely of any great thickness. This series is highly contorted, being folded into a number of parallel anticlinal and synclinal folds, striking North and South, and often presenting the appearance of a highly-inclined dip, which is either nearly vertical or trending to the Eastward. These rocks are much broken and faulted by numerous diorite and granite dykes. They contain many quartz veins and iron lodes, and it is in this group of rocks that the principal auriferous deposits exist. This great series of rocks may be subdivided into three sections—the granites, the gneisses, and the schists, which, as a rule, run in parallel belts North and South, with a slight trend to the North-West.

The first, or Western belt extends from the Murchison River to the South coast, but is very little exposed, except in the Northampton District, and a little South of the Irwin River, where it is rich in copper, lead, and zinc lodes. It underlies the sandy coastal plains, outcropping here and there at the base of the Darling Range, forming a small range between the Capes Naturaliste and Leeuwin, and characterised throughout by lead, copper, and zinc lodes. The rocks of this belt are, for the most part, comparatively soft, consisting of clay slates (often kaolinised), quartzites, and schists, with dykes of diorite and granite, and veins of quartz containing lead, copper, zinc, iron pyrites, and ferruginous graphite.

The second belt extends Northward from the South coast (forming the bold escarpment at the edge of the great plateau called the Darling Range) as far as the Murchison River. It then follows this river in a narrow belt in a North-Easterly direction for about 200 miles, where it suddenly spreads out to the East and North-West from the Robinson Range to the Lyons River, disappearing beneath the magnesian limestone to the Northward. In this belt the rocks are mostly hard and crystalline, consisting principally of gneiss and schist, with dykes of diorite, granite, and felstone, and veins of quartz. The latter (as well as the diorite) often contains large quantities of pyrites, most of which yield a little gold. Tin is also being worked at the Greenbushes Tinfield, the ore being derived from the disintegration of quartz-porphyry dykes, in which it is associated with tourmaline and titanic iron. Besides iron and manganese, large deposits of kaolin of a very fine quality occur, as well as veins containing mica and asbestos; but these latter are too much weathered at their outcrop to be of any value. Near Bridgetown a very large deposit of graphite has lately been opened up; it exists in the form of a bed between talcose schists, about 20 feet in thickness.

The third, or great granite belt, lies about 100 miles East from the West coast, and is about 100 miles in width, extending from the South coast to the Murchison River. It consists of a series of bold, bare outcrops of gneiss or granite, often 100 feet in height, and covering several hundred acres in extent, rising from loamy flats. The rocks mostly outcrop in the depressions of the table-land, the higher portions of which are covered by sand plains. This belt is absolutely destitute of mineral veins, and it is due to this barrier that the rich goldfields to the Eastward remained so long unprospected. These outcrops are made use of for the conservation of water in this dry portion of the Colony, as they shed water like a house-roof, whilst around them there are many natural dams or basins filled with sand, which are either being cleaned out or wells are being sunk in them. The rocks of this belt consist entirely of gneiss and granite, much fissured and faulted, and traversed by numerous dykes of granite and diorite, whilst the main masses generally enclose fragments and masses of schistose and gneissic rock.

The fourth, or first auriferous belt, is situated immediately to the Eastward of the granite belt, and is about 20 miles in width. It starts from the South coast at the Phillips River, extending Northward in a narrow belt by the Ravensthorpe Range, Parker's Range, Southern Cross, Golden Valley, Mt. Jackson, Mt. Kenneth, Mt. Magnet, Austin's Lake to Cue. Thence it takes a slight bend to the North-East to Nannine and the Star of the East, where it strikes more to the North, and skirting round the heads of the Murchison and Gascoyne Rivers, it turns North-West and follows down the Ashburton Valley to its junction with the Henry, finally disappearing beneath the Palæozoic formation. The rocks of this belt consist mostly of hornblende, mica, or talc schists, of which the hornblende schists so closely resemble diorite that it is impossible to distinguish it in a broken specimen. The rocks of this belt are a good deal broken and faulted by granite and diorite dykes, and quartz lodes containing gold, iron, and copper. There are

Digitized by Google

also some large magnesia lode-masses, rich in fine gold, which will probably prove to be serpentine at a depth. Many of the lodes also contain large quantities of chlorite.

The fifth, or second granite belt, is about the same width, and similar in every way to the first mentioned. It extends from the South coast, following the line of the first auriferous belt North, and, like it, dipping under the Palæozoic tableland of the Fortescue. Only a small portion makes its appearance on the Northern side of the Yule River, near Pilbara, upon the North-West coast.

The sixth, or second auriferous belt, lies next, and at present its width is unknown, but it is certainly of considerable width in places, and has proved, wherever prospected, to be extremely rich in gold. It extends North from the Dundas Hills (where this formation first outcrops from below the sand plains) by Wagemulla,* Coolgardie, and Three Pinnacles, Ularring, Lake Carey, and following about the same line as the other belts, and turning with them to the North-West by the Nullagine, Marble Bar, Pilbara, Egina, and Mallina upon the North-West coast. The rocks of this belt are generally very similar to those of the first auriferous belt, but the formation and lodes are a great deal more faulted and broken; however, to make up for this, they are the richest that have ever been discovered.

The hornblende rocks of this Colony are very remarkable in character, being met with most abundantly from North to South. They vary immensely in colour, structure, and external character, some, at first glance, having the appearance of clay-slate; but on being fractured they exhibit a structure similar to diorite, whilst others again only contain green crystals of hornblende disseminated through a quartz matrix, or have a jade-like appearance, which latter variety are continually being mistaken for copper, nickel, or silver. With these rocks are associated the principal mineral deposits of the Colony—gold, tin, copper, antimony, lead, zinc, manganese, and iron.

Cambrian Rocks.

An undoubted Cambrian fauna has been discovered in the rocks of the Kimberley District. The fossils consist of *Salterella Hardmani* and *Olenellus* (?) *Forresti*, and are associated with certain limestones, sandstones, quartzites, clay slates, and sandy flags. Very little is known of these Cambrian rocks at present; their superficial area, however, would seem to be extensive, for they have already been proved to extend in a North-East and South-West direction from the Burt Range and for some distance to the Southward of Mount Dockrell. No estimate has yet been made of the thickness of these the oldest fossiliferous beds yet found in the State. The strata have been folded in such a way that the principal axes of folding are North-West and South-East.

The Cambrian rocks of Kimberley are of considerable economic importance, in that they form the matrices of those auriferous quartz reefs which have already been exploited.

Up to the end of 1901, 15,188ozs. of gold were returned from this district. Although these figures include a considerable quantity of alluvial gold, it is a natural assumption that this was originally derived from the disintegration of the ore deposits in the Cambrian beds.

Silurian Rocks.

The occurrence of Silurian rocks in Western Australia has been more inferred than proved.

Writing in 1861, Mr. F. J. Gregory described certain rocks of the Mount Barren Range as being probably of Silurian Age, though the evidence upon which this deduction is based is not given.

* Now spelt "Widgemooltha."

Digitized by Google

The rocks of the Stirling Range, which lies about 50 miles North of Albany, have been claimed as Silurian. The beds consist of quartzites, sandstones, and shales, the whole being traversed by quartz veins. The beds are highly folded, contorted, and faulted in places. According to the researches of Mr. H. P. Woodward, the rocks at the Western end of the Range, near Mondinup, have been thrown into three sharp anticlinal and synclinal folds, in a distance North and South of about 10 miles, by a lateral compression from the South—

This series of rocks, although covering a considerable area, are plicated in such a manner that two or three beds form the entire range, rising abruptly from beneath the plain to the Northward, and dipping under it again to the Southward. . . . . *

The strata chiefly developed in the Leopold and Mueller Ranges of Kimberley have been provisionally classed as Silurian, more, however, on account of their lithological character than on any stratigraphical or palæontological evidence.

The rocks composing the Leopold and Mueller Ranges are of various textures. They are sometimes pure crystalline quartzites, and sometimes fine-grained but highly indurated grits, having an almost vitrified appearance. Coarse pea-grits, and quartzose conglomerates are everywhere met with, but, as a rule, the whole mass shows indication of extreme metamorphic action. Interbedded with these, however, we meet with beds of soft sandstones and purple slates, which have apparently suffered no alteration whatever. †

Much detailed field work is, however, required before the occurrence of undoubted Silurian rocks in Western Australia can be considered to have been definitely proved.

Devonian Rocks.

The Devonian rocks of Kimberley have been described by Mr. E. T. Hardman as consisting of hard grits, conglomerates, indurated limestones, and shales. They are seen to rest unconformably upon a series of schists and slates which have been claimed as being of Lower Silurian Age: they are covered by basaltic lavas, which are in turn partly overlaid by undoubted Carboniferous rocks. The Devonian strata occupy an area of about 2,000 square miles, and calculations have shown that their thickness is about 10,000 feet.

The Kimberley Devonian rocks have yielded the following fossils:—*Actinostroma clathratum*, *Stromatoporella Eifeliensis*, *Pachypora tumida*, *Cyathophyllum virgatum*, *Cyathophyllum depressum*, *Aulopora repens*, *Spiroribis omphaloides*, *Spirifera*, *Atrypa reticularis*, *Rhynchonella pugnus*, *Rhynchonella cuboides*, *Orthoceras*, and *Goniatites*.

Associated with these sedimentary beds are contemporaneous basalts, dolerites, anamesites, volcanic breccias, and ashes. These volcanic rocks extend over a large area of country, and also attain a considerable thickness, having been estimated to reach from 1,000

* The country between Broomehill and the Dundas Hills, and the Mines in that neighbourhood. H. P. Woodward. *Ad interim* report on the Department of Mines for the half year ending 30th June, 1894. Perth: By Authority: 1894, p. 14.

† On the Geology of the Kimberley District. E. T. Hardman. Perth: By Authority: 1895, p. 23.

Digitized by Google

to 1,100 feet. No undoubted volcanic focii have been observed in the district over which these lavas extend, though certain peaks and cones have been mentioned by Mr. Hardman as being likely to prove on detailed examination to be ancient volcanic vents.

Carboniferous Rocks.

The Carboniferous rocks of Western Australia cover a very large area of country, and seem to be particularly well developed in the Kimberley District. The formation is divided into an Upper or Sandy, and a Lower or Calcareous series.

The occurrence of the Carboniferous formation would seem to have first been published by Sir George (then Lieut.) Grey in the year 1841, in his journals of the two Expeditions of Discovery in North-Western and Western Australia during the years 1837-39. Dr. F. von Sommer, the first Government Geologist of the State. traced the Carboniferous beds in 1848, from the heads of the Irwin River to those of the Moore, for a distance of 160 miles.

There are three distinct districts in which fossiliferous Carboniferous rocks are known in the State—viz., Kimberley, the Gascoyne, and the Irwin River District.

The Kimberley Beds.—The Carboniferous rocks of Kimberley are represented by wide-spread deposits of sandstones, grits, and conglomerates, all containing bands and nodules of hematite or ironstone, as well as magnesian and other limestones.

The Upper or Sandy Series, according to Mr. E. T. Hardman,* by whom these beds were first described—

Extends from Roebuck Bay, on the West, to the Napier and Oscar Ranges on the East, and is recognised alike on the North side of Stokes Bay, and in the St. George Ranges, 100 miles to the South . . . . . It may reasonably be asserted that this sandstone formation is considerably over 1,000 feet in thickness, for the Grant Ranges have an elevation of over 900 feet above the plain, while the nearest limestone is 60 or 70 miles distant; and probably its continuation lies (even assuming a moderate angle by dips) many hundreds of feet below the sandstones of the Grant Range and Mount Anderson. The sandstones here dip at high angles, so that the thickness of strata is considerably more than the actual height of the hills above the plain. . . . . Besides those of the Fitzroy, it occupies a considerable portion of the Haughton Ranges, which extend for some 35 or 40 miles. It is next seen in the Ord District, along the North-West of which it stretches for over 50 miles in length, with a minimum width of about 20. Here it rises into high ranges, of which Dixon Range and the hills, marked J39, are prominent examples. Hardman Range, to the South, is also composed of it. Further North the strip of country extending from Mount Elder along the Negri to the South of Mount Panton is mainly composed of this formation, although occasionally subordinate bands of limestones are met with in these rocks.

Of the Carboniferous Limestone (Lower) Series the same author writes :—

This formation extends in a wavy line from Alexander Creek through the Napier Range, Oscar Range, Geikie Range, etc., from North-West to South-East, as far as the Margaret River, ending within a few miles of the Leopold Range. In this direction it is at its widest, as its breadth may be estimated from the various outcrops and ranges above the plains at 30 miles. It gradually narrows northwards, and at Napier Range is not more than seven miles wide; this includes the portion hidden beneath alluvium, etc.; but the limestone is the same throughout. The general character of the limestone is the same throughout. It is high

* The Geology of the Kimberley District, Western Australia. Perth: By Authority: 1885

Digitized by Google

coloured, compact, brittle, splintery, more or less magnesian limestone. In colour, it varies from light grey to flesh colour, and sometimes pink. For the most part it is massively bedded, and it is not always easy to discern the direction of the bedding, as it is cut through by numerous joint lines, and often coated with stalagmite. The general appearance it presents is that of a very rugged vertically-bedded rock, in consequence of these joints.

On examination, however, it is seen that the rock dips at a very moderate angle, varying from 5° to 25°, the direction of the dip being usually at right angles to the trend of the hills. The limestone is interbedded with many thick layers of shale and thin arenaceous limestone; but these only occur in the lower beds, at the base of the hills.

Further to the East the Carboniferous limestone appears in great force in the Rough Range, and extends to the South-East towards Haughton Range, a distance of nearly 30 miles. The extent of the limestone laterally, that is to the South-West, is not known, but in many places it is seen for six or eight miles, and South-West of Mount Huxley it stretches from its Eastern edge, near J8, for nearly 20 miles in that direction. The limestone crops up at intervals between this range and Mount Pierre to the Northward, and is seen in various parts of the River Margaret, extending in rather high hills on the North of that river, both to the East and West (Hull Range, Mount Kranso, etc.)

The Carboniferous Limestone Series for the localities above described

Consist in great part of rather massively bedded light grey and sometimes flesh-coloured limestone, often magnesian, but are interbedded with thin, flaggy, earthy, and sometimes sandy limestone. But these chiefly occur among the lower beds, and are often interstratified with dark grey sandy shales. The valley of the Margaret is mainly composed of thin, flaggy, hard limestone (which gives a bell-like sound when struck with the hammer), earthy fetid limestones and shales, with nodular limestone bands.

From the last mentioned locality, no Carboniferous Limestone makes its appearance for a distance of about 120 miles.

A short way below the junction of the Panton and Elvire Rivers limestone again makes its appearance, and occupies a wide area, extending as far North-Easterly as for several miles beyond the Negri, in all about 75 miles; while in width it averages from 20 to 30 miles. This portion of the limestone country rises in a succession of low and almost imperceptible terraces into high tablelands. One of these extends to the East of the Ord near the cattle station, and another to the North and East of the Negri River, where it is capped by Mount Panton. The Ord limestones are for the greater part hard and flaggy, rarely massive, usually grey in colour, sometimes sandy or magnesian, and seldom fossiliferous. In many parts of the district they are interbedded with red shales, marls, and sandstones, the former of which contain occasionally layers of gypsum, together with traces of rock salt.

The Carboniferous beds of Kimberley have yielded the following fossils:—*Lepidodendron*, sp.; *Stigmaria*, sp.; *Stromatopora concentrica* (?); *Stromatopora placenta*, sp.; *Pachypora tumida*; *Zaphrentis*, sp.; *Syringopora*, sp.; *Actinocrinus*, sp.; *Platycrinus*, sp.; *Poteriocrinus crassus*, Miller; *Pentremites*, sp.; *Serpula*; *Spirobis*, sp.; *Fenestella plebeia* (*antiqua*), McCoy; *Productus giganteus*; *Productus longispinus*; *Productus semireticulatus*; *Chonetes*, sp.; *Chonetes Hardrensis*; *Discina*; *Orthis resupinata*; *Strophalosia Clarkei*, Eth. fils; *Rhynchonella pugnus*; *Rhynchonella pleurodon*; *Rhynchonella cuboides*; *Orthotetes crenistria*, Phillips; *Streptorhynchus crenistria*; *Terebratula hastata* (?); *Terebratula sacculus* (?); *Pleurotomaria*, sp.; *Toxonema*, small sp.; *Natica*, sp.; *Ceriopora*, sp.; *Chaetetes tumidus*; *Stenopora Tasmaniensis*; *Cyathophyllum*, sp.; *Cyathophyllum virgatum*; *Cyathophyllum depressum*; *Lithodendron affine*.

Digitized by Google

The Gascoyne Beds.—The strata of the Gascoyne River consist of a series of crystalline limestones, full of corals, dipping at an angle of about 10 degrees to the Westward. Beneath these are shales, which yield Lower Carboniferous fossils. Near the base of the series is a boulder conglomerate of glacial origin, resting upon clay slates or shales. The boulders in the conglomerate are of crystalline rocks, and give strong evidence of having been subjected to ice-action.*

The following is a list of fossils from the Gascoyne River beds :—*Pachypora tumida*, Hinde ; *Zaphrentis*, sp. ; *Amplexus pustulosus*, Hudl. ; *Amplexus nodulosus*, Phil. ; *Syringopora reticulata*, Goldf. var. *patula* ; *Stenopora Tasmaniensis*, Lons ; *Cyathocrinus*, sp. ; *Poteriocrinus crassus*, Miller ; *Fenestella plebia* (*antiqua*), McCoy ; *Polypora Australis*, Hinde ; *Protoretepora ampla*, Lons. ; *Rhombopora tenuis*, Hinde ; *Evactinopora crucialis*, Hudl. ; *Edestus Davisii*, H. Woodward ; *Ariculopecten Illawarensis*, Morris ; *Ariculopecten limaeformis*, Morris ; *Athyris Roysii*, Leveille ; *Athyris Macleayana*, Eth., Fils. ; *Spirifer Striatus*, Martin ; *Spirifer* cf. *crassus*, Konin ; *Spirifer vespertilio*, G. Sow. ; *Spirifer* cf. *convolutus*, Phil. ; *Spirifer Kimberleyensis*, Foord ; *Spirifer lata*, McCoy ; *Spirifer Hardmani*, Foord ; *Spirifer Musakheylensis*, *Dav.* Var. *Australis* ; *Syringothyris exsuperans*, de Kon.

The Irwin River Beds.—The existence of the Carboniferous rocks on the Irwin River would seem to have first been noted by Mr. Surveyor Gregory some time during the year 1846. Dr. F. von Sommer, then Government Geologist, examined and reported on the scene of Gregory's discovery, and traced the formation from the head of the Irwin to the Moore River, a distance of about 160 miles.

The area was mapped in 1895, by Mr. H. P. Woodward, who at that time occupied the post of Government Geologist. This gentleman reports that the Carboniferous rocks extend

From Mingenew in an Easterly direction, covering an area of about 20 square miles, its greatest length from North to South, from Badgeree Pool upon the North branch of Mount Scratch, being about 30 miles, whilst the greatest width, from Mingenew to Narandagry, upon the Lockyer River, is about 17 miles. To the North-West this area is bounded by the high sandy tableland which extends away to the Northward as far as the Greenough River. The South is bounded for the most part by the low outcrops of metamorphic rock, which contains many copper lodes ; to the Eastward by the bold escarpment of crystalline rocks, flanked by horizontally-bedded Tertiary sandstones, which often present towards the plains vertical cliff faces of as much as 200 feet, particularly where streams have cut deep channels through them ; whilst to the Westward it is bounded by more high sandy plains, which extend as far as the coast.

The Carboniferous rocks of the Irwin River have yielded the following fossils :—*Pleurophyllum Australe*, Hinde ; *Pleurophyllum sulcatum*, Hinde ; *Fenestella*, sp. ; *Productus tenuistriatus*, Vernueil ; *Productus subquadratus*, Morris ; *Productus undatus*, Defrance ; *Chonetes Pratti*, Dav. ; *Spirifer Musakheylensis*, Dav. var. *Australis* . *Syringothyris exsuperans*, Konin ; *Reticularia lineata*, Martin ; *Reticularia crebristria*, Morris ; *Orthotetes crenistria*, Phil. ; *Pachy-*

* Annual Progress Report of the Geological Survey for the year 1900, pp. 26-28. Perth : By Authority : 1901.

Digitized by Google

domus carinatus, Morris; *Aviculopecten*, sp.; *Modiola*, sp.; *Edmondia*, sp.; *Sanguinolites*, sp.; *Bellerophon decussatus* (?), Flem.; *Orthoceras*, sp.; *Discites*, sp.

Mesozoic Rocks.

The existence of rocks containing a secondary fauna would seem to have been first made known in the year 1861 by Mr. F. T. Gregory, in a paper communicated to the Geological Society of London by Sir Roderick Murchison. Gregory says these beds

Are almost exclusively siliceous in character, containing only a few beds of chalk of very inferior quality. They abound, however, more in fossils than the Carboniferous do, and with the exception of the recent coast limestone, more so than any other formation. Flints are rarely found in these. The bed of the Greenough River is the best spot for procuring specimens, although a few are found in the Chalk Hills near Gingin (spines of Echinoderms, etc.).

Writing in 1863, Charles Moore observes that the bulk of the Mesozoic fossils from Western Australia are of Jurassic Age, but in 1870, in a paper read before the Geological Society (of London), he expresses the opinion, based upon fossil evidence, that Cretaceous rocks occur in addition to those of Jurassic Age. Since that date, however, very few sectional details have been given of the Mesozoic rocks of the State, although a fair collection of fossils has been made. These beds have been studied in the field by Mr. H. Y. L. Brown, who thus describes the strata, which he claims to be of Oolitic Age:—*

The character of the strata belonging to this period may be described as follows:—Beds of highly ferruginous claystone or shale, sandstones, grits, conglomerates, clays, and limestone, placed in horizontal layers upon the older rocks, which originally they must have almost entirely covered, but have since been cut into and denuded to a great extent from off them, in such manner as to leave tablelands, isolated tablehills, and peaks with steep escarpments and slopes. Their average elevation is about 600 feet above sea level. The surface of this formation is generally coated with a deposit of sand, arising from the weathering of the sandstones, the larger areas being known by the name of sand plains. There are two principal areas occupied by this formation. The first, which varies in width from 10 to 30 miles, extends from the neighbourhood of Gingin and Yatheroo to the Murchison, and probably a long distance further Northward, in a line more or less parallel to the coast. Proceeding Eastward, it thins out and only exists there as outliers and cappings on the hills. Its average thickness, where best developed, is some 400 feet. The second area commences near Cape Riche, and stretches in a North-East direction beyond the Phillips River, thinning out Eastward to mere cappings on the hills.

The uppermost beds in the first-named area are generally more ferruginous than the lower, and consist of highly ferruginous concretionary claystone, shale, and grit.

The great denudation which has operated since the close of this period has removed a great portion of the rocks, leaving the remainder as undulating plateaux and flat-topped hills, at the bases of which the older rocks outcrop. As a rule, these strata are horizontal, although in some cases a slight undulating dip is perceptible. The interstratified beds of white, yellow, and sometimes ferruginous limestone, attaining the thickness of 30 feet, which occur chiefly in the neighbourhood of Champion Bay, do not seem to be persistent, but are found, as it were, in patches, which gradually thin out.

As the limestone composing them is made up of shells, which in some cases have consolidated into a solid rock, in others have retained their original form,

* General Report on a Geological Exploration of that portion of the Colony of Western Australia lying Southward of the Murchison River and Westward of Esperance Bay. Perth: By Authority: 1873, pp. 11-14.

Digitized by Google

it seems most probable that the accumulation of shells in hollows, in ancient sea-beds, is the cause of their now being found in isolated areas. The most common fossils found included species belonging to the genera *Ammonitidæ*, *Belemnitidæ*, *Ostreidæ*, *Pectenidæ*, *Trigonidæ*, *Rhynchonellidæ*, etc. These fossils are generally found in the limestone, whole masses of rock being composed of them: they are also found in the hard ferruginous shale and sandstone, in which case they have been converted into oxide of iron. In a paper published in the proceedings of the Geological Society, the author, Mr. C. Moore, considers the fossils from these beds to represent the fossil fauna of the Lias and the Lower Oolitic formations of England.

The whole chalky limestone of Gingin, Yatheroo, and Dandarragan, which outcrops from beneath the sandy soil of these localities in patches, most likely is also of Mesozoic Age.

As yet, owing to the surface accumulations of sand, etc., which hide it from view, no sections are to be seen which show whether it over or underlies the ferruginous rocks of the district. At different spots in the Darling Range, etc., beds of ferruginous grit, claystone, and conglomerate exist, together with beds of unconsolidated sand, which may belong to this formation. Between Brookhampton and the Upper Blackwood Bridge, near Coverley's, and elsewhere along the road, on the tops and slopes of the moderately steep ranges which occur there, there are deposits of soft, earthy claystone and ironstone, containing perfectly polished boulders of reddish sandstone, grit, and quartzite, varying in weight from a few ounces to 50 pounds, and of more or less spherical and elliptical shapes.

It is difficult to imagine how these boulders, which have evidently (judging by their waterworn condition, and the absence of any similar rocks *in situ* in the district) been transported a considerable distance, and now occupy the tops of ranges, could have been placed in their present conditions except by glacial action, if such were possible in this latitude. The outside of the pebbles and boulders are, whenever the rock is hard enough, smoothly polished; but, as far as I am aware, there are no striæ or scratches on them.

The second principal area of this formation, which embraces the country extending from near Cape Riche to beyond the Phillips River, consists of a series of horizontal sandstones, grits, and conglomerates, capped generally by the usual ferruginous claystones, the whole thinning out on to the granite along its northern boundary at a level of from 600 to 700 feet above the sea, and forming level plains and table hills, with steep escarpments along the Gardiner, Fitzgerald, Hamersley, Phillips, and Jerdicart Rivers. To the Southward and Eastward the formation, which attains a thickness of some 300 or 400 feet, rises on the slaty rocks of the Mount Barren and Jerdicart country. In lithological and stratigraphical character and position they are almost precisely similar to the same formation in the more Northern parts of the Colony. White marly saliferous sandstones, ferruginous grits and claystones, conglomerate reddish sandstones, etc., are the principal rocks met with. Perfect specimens of fossil sponges are frequent in some of the caves which occur along the escarpments, hanging from the roof and sides, where the rock has weathered away; worm casts are also abundant. Mainbenup, near Esperance Bay, is the farthest point Eastward where I have observed the formation. At Cape Riche beds of white and mottled sandstone, overlying granite, form low but steep cliffs along the shore of the bay.

Since the above was written the Mesozoic beds have received further attention, and our knowledge in connection with them has been materially increased. Boring operations have been carried out in these beds in the vicinity of Geraldton, where the strata have been proved to consist chiefly of sandstones, etc., which attain a thickness of at least 1,100 feet.

In the neighbourhood of Perth a great many bores have been put down in the search for artesian water, and a series of fossils obtained which, however, yet require critical examination. These have been submitted to Mr. R. Etheridge, jun., of the Australian

Digitized by Google

Museum, Sydney, and Palæontologist to the Geological Survey of New South Wales, who writes*:—

That they trend to the opinion that the strata are either Triassic Coal Measures or Lower Cretaceous. From the nature and general appearance of the matrix of the fossils, I incline to the belief that the beds are really of Lower Cretaceous age rather than Triassic.

It is possible that to the former horizon the Coal Measures of the Collie River may belong.

The following fossils have been obtained from the Mesozoic Rocks of this State:—*Cristellaria cultrata*, Montfort, *var radiata*, Moore; *Rhynchonella variabilis*, Schloth; *Avicula Munsteri*, Golds.; *Avicula echinata*, Sow.; *Avicula inæquivalris*, Sow.; *Lima proboscidea*, Sow.; *Lima punctata*, Sow.; *Ostrea Marshii*, Sow.; *Pecten cinctus*, Sow.; *Pecten calvus*, Munster; *Pecten Greenoughiensis*, Moore; *Astarte Cliftoni*, Moore; *Astarte apicalis*, Moore; *Cucullæa oblonga*, Sow.; *Cucullæa inflata*, Moore; *Cucullæa semistrata*, Moore; *Cardium*, sp.; *Cypricardia*, sp.; *Gresslya domaciformis*, Ag.; *Isocardia*, sp.; *Myacites liassiamis*, Quenst.; *Myacites Sanfordii*, Moore; *Tancredia*, sp.; *Trigonia Moorei*, Lycett; *Pholadomya ovulum*, L. Agass.; *Teredo Australis*, Moore; *Unicardium*, sp.; *Amberleya*, sp.; *Cerithium Greenoughiensis*, Moore; *Eulima* (?), sp.; *Phasianella*, sp.; *Trochus*, sp.; *Turbo Australis*, Moore; *Turbo laevigatus*, Sow.; *Rissoina Australis*, Moore; *Belemnites*, sp.; *Belemnites canaliculatus*, Schloth; *Nautilus perornatus*, Crick; *Nautilus sinuatus*, Clarke; *Ammonites* (*Dorsetensia*) *Clarkei*, Crick; *Ammonites* (*Stephanoceras*) *Australe*, Crick; *Ammonites* (*Sphaeroceras* ?) *Woodwardi*, Crick; *Ammonites* (*Sphaeroceras*) *semiornatus*, Crick; *Ammonites* (*Perisphinctes*) *Championensis*, Crick; *Ammonites* (*Perisphinctes*) *robigonosus*; *Ammonites Aalensis*, *var Moorei*, Lycett; *Ammonites Walcottii*, Sow.

Cainozoic Rocks.

The Cainozoic rocks of the State occupy a very extensive area.

They are thus described by Mr. H. P. Woodward:—

Eocene.

Coralline and Chalky Limestones with Flints.—The beds extend the whole length of the Great Australian Bight, and for 150 miles inland. They present a bold vertical face, of great height to the sea, evidently marking the line of a fault.

Coralline Limestones.—These form the lower beds of the coast limestone, and contain a great many fossils of Eocene age, some of which were sent to England a few years ago to be described. The beds at Shark Bay and on the islands there are probably of the same age.

The Calcareous and Ferruginous Sandstones, Grits, and Conglomerates.—These beds are met with between the limestone hills, and the ranges probably belong to this Tertiary Series, as well as the ferruginous conglomerates which rest unconformably upon the Cretaceous rocks to the Southward of Champion Bay.

* 9th March, 1899.

Digitized by Google

Pliocene.

"Pindan"—Cracked Plains.—These large sandy plains are greatly developed on either side of the Fitzroy River, and stretch far away to the Southward, where they form Warburton's Great Sandy Desert. On the Ord River there are also some small stretches of country of this character, but nowhere of any very great extent. Owing to its porous nature, these plains are waterless in spite of the heavy rainfall; nevertheless, as a rule, they are covered with abundance of vegetation.

Sand Plains.—These form one of the characteristic features of Western Australia, extending as they do from one end of the Colony to the other. The great sand plains of the interior are often 20 or 30 miles across, but they contain in places a good deal of the clay and iron which cement the grains of sand together, so that, there being a fair rainfall, they are covered with hardy vegetation which, during the two spring months, is perfectly gorgeous with flowers, and they form good summer grazing ground. These sand plains mostly appear to overlie the desert sandstone formation which forms the tableland of the interior of Australia

Ferruginous Sandstones and Variegated Clays.—Plant remains are met with in these beds on the lower courses of the Gascoyne River, also at the Nullagine; and similar rocks, without the plant remains, cap the low ranges in many places throughout the Colony. They are probably the Upper Tertiary age, although they may be still more recent. Beds, probably of this age, containing large quantities of fossilwood, and beds of brown coal, are also met with below the coastal sand plains of the South.

Pleistocene.

Ancient river gravels and lake basins are found in several places in the ranges, and are similar in character to the deep leads of the Eastern colonies which proved so rich in gold. They consist of pipeclay, ferruginous sands, gravel conglomerate, and mottled clay, and it is reported that Diprotodon bones have been found in one of these near Bridgetown, where these deposits are largely developed, and are now being worked for stream tin.

Ancient river gravels are met with on the Nullagine and Ashburton goldfields, but, as a rule, they are not common in these districts.

Lower Estuarine Deposits.—These beds occur as far inland as Perth, where in deepening the river channel, large quantities of oyster and other shells are met with, proving beyond a doubt that the Swan was formerly a much larger arm of the sea than it is now. The oysters must have been exterminated by the silting up of the mouth of the river, which prevented the influx of salt water, keeping it fresh or brackish for a large part of the year. The deep holes in the bed of the Swan, to the West of Perth, probably owe their existence to the collapse of caverns eroded in the limestone which forms the bed of the river, by a subterranean flow of water containing carbonic acid.

Shelly Limestones and Sandstones.—These occur all along the South-Western coast, and contain fossils very similar to the living forms, upon which in many cases the nacre of the shell is still preserved.

The shelly limestones and sandstones of Shark Bay and those met with here and there along the coast, as far North as North-West Cape, probably also belong to this series.

Recent.

Alluvium of Lake Basins.—Throughout the interior there is a series of what are called lakes, which are in reality nothing more than large salt flats, boggy marshes, or clay pans, almost on a dead level, that drain one into the other, and eventually, if the season has been wet enough, discharge themselves into the upper course of some river; but this rarely happens, owing to the enormous surface they present for evaporation. One result of this is that these large flats, nearly every year, receive a fine covering of clay, upon which the salts contained in the water crystallise out, to be redissolved and added to from time to time, till in some places, which may be a little lower than the rest, or where some obstruction occurs to check the flow of the water, very large deposits of salt accumulate. These lakes are surrounded by red clay flats, which also contain a great deal of salt; in fact, the whole interior of the Colony is salt, since the salts leached from the rocks are not carried away to the clay, to be redistributed over the surface of the country by the wind.

Salt and Gypsum Deposits.—Many of the lake basins are covered by deposits of salt and gypsum, the latter often occurring in the form of beautiful crystals (selenite).

Digitized by Google

River Valleys.—Loam deposits are formed by the rivers wearing away the old rocks, and carrying the finer material down from the hills and depositing it on the open level country, where it forms large rich plains. These deposits are often of great extent, spreading on either side from the rivers for a considerable distance. They are often very similar in character to those of the lake basins, but with this great difference, they contain less salt. They are best studied on the Upper Murchison, the Gascoyne, or Fitzroy Rivers, where there are large clay and loam flats, often many miles wide. These beds have probably been formed in the same manner as those of the lakes; but, having been better drained, the salt has been carried away by the rivers. Certain tracts, however, still contain much salt, which is replenished from time to time by large discharges of salt flood water from the lakes at the sources of the rivers.

All the rivers North of the Greenough form these large flats, but those in the South form, instead, small deposits of clay, loam, sand, and gravel throughout their courses, which are very fertile.

River Gravels.—These consist of sand, gravel, and angular fragments of rock, and are found in the beds of the Northern streams, which large rivers are often as much as a mile wide.

In the North there are some extensive alluvial deposits, following the sea coast, not generally situated in the river valleys themselves, but formed by the rivers in time of flood; they are not, as a rule, of any great thickness, because outcrops of rock are frequent.

Brick Earth.—These deposits are met with in the valleys of many of the Southern rivers. They are of high quality, making excellent terracotta ware, drain pipes, and bricks.

Estuarine Deposits.—These are met with at the mouths of the large Northern rivers, where there are periodical tropical and semi-tropical floods. The rivers bring down large quantities of mud, which they deposit near the mouths, forming (excepting where coastal currents interfere) a kind of swampy delta, for the most part salt, overgrown with mangroves, and composed of a black, greasy mud, full in many places of recent petrifactions of crayfish, wood, and worm-tubes.

The estuarine deposits of the South are of very slight account, for the rivers are comparatively small, having but short courses, and discharge themselves, on emerging from the gorges they have cut through the ranges, into the arms of the sea, which runs from the coast to the foot of the ranges. Moreover, they are but seldom flooded by excessive rainfall, and so bring down very little detritus.

Mangrove Swamps.—Black, muddy, salt swamps, covered with mangrove, fringe a great part of the coast North of North-West Cape, or that part where the tide has considerable rise and fall. They are situated just about high-water mark, and are therefore covered either by each high tide or only by the spring tides.

Sand dunes occur along the West and South coasts at the river mouths, or where the land is low. They sometimes, as at Geraldton, reach a considerable height, and are a source of trouble, because they are constantly travelling unless kept carefully bushed or planted. Very often excellent water can be obtained beneath them, although that under the neighbouring flats may be bad.

Coastal Sand Plains.—These plains are met with in the Southern portion of the Colony, extending from the foot of the ranges, and cover the intervening lower ground between them and the sea. The sand here is much looser than in the interior, and is often of considerable thickness, of a red colour below the surface, and exhibits false bedding, which proves its origin to be æolian or windblown. There are many lakes and swamps on the plains, the water in which is often held by deposits of peat.

Raised Beaches.—These were noticed by the late Mr. Hardman near Roebuck Bay, about 10 to 15 feet above the present sea level. One extends nearly 25 miles inland, and is from 12 to 18 miles wide. Its surface is covered with salt grass and samphire. Recent marine shells are found here and there, and in sinking a well a shelly deposit several feet in thickness, containing specimens of sea shells now found living on the coast, was passed through. Raised beaches of considerable extent are also met with at the foot of the Great Australian Bight.

Marine Shell, Marls, and Gravel.—These are of frequent occurrence along the coast between North-West Cape and the Leeuwin.

Surface Deposits.—Under this head come a large series of deposits not already referred to, the principal of which are the "gravel" and "ironstone," which cover a considerable extent of the South-Western portion of the Colony.

Digitized by Google

These deposits are in reality indurated, nodular, ferruginous claystones called gravel, sometimes cemented by iron forming a conglomerate, and ferruginous sandstones, both of the latter being locally known as ironstone. They result from the disintegration of the different underlying formations (mostly crystalline rocks), and are most largely developed in the forest ranges, and it is upon them that the best jarrah grows. The so-called gravels are often of considerable thickness, and are largely used for ballasting railway lines. Their origin is difficult to understand, without it is due to bush fires, as they cap the highest ridges up to an elevation of 1,200 feet.

Volcanic Rocks.

Volcanic rocks, claimed as being of the Devonian Age, have been described by Mr. E. T. Hardman, from the Kimberley District :—

They consist of many varieties of basalt, including dolerite, and amanesite, trachy-dolerites, lavas, volcanic breccias, and ash beds, ferruginous wackenite, etc., and . . . . occupy a very extensive area of the country to the East of the Ord. The basaltic rocks not only occupy a considerable superficial area, but they are also of considerable thickness. . . . . This formation occurs as a vast sheet or floor of volcanic rocks, which was formerly ejected and spread out over the Devonian rocks, and subsequently in part denuded, and then covered by the carboniferous deposits, and these in their turn being to a great extent carried away, the basalt has again been exposed over the extensive area where we now find it. That it is of an intermediate age between the Carboniferous and the supposed Devonian rocks is certain, for within a short distance it is found resting on the one and covered by the rocks of the other formation, as at the junction (and a few miles below it) of the Panton and Elvire.

In the Ord District these rocks form a great plateau, as hereinbefore described. As a rule, they show a distinct bedding, the lines of which dip inwards to the mountains at angles from 5 to 10 degrees. The traps are extremely varied in character ; although they may be regarded as the same rock as a whole, still in the same neighbourhood many varieties of specimens can be obtained.

Ancient lavas and breccias are common amongst these rocks, and some of the latter would seem to have been deposited under water, as they are distinctly stratified. Volcanic ash or tufas, consisting of fragments of basalt, trachy-dolerite, lavas, etc., are met with also. In one locality, near Mt. Napier, the deposit contained large angular fragments of the easily-recognisable Devonian grits ; the nearest place where such rocks are at present found being 40 miles distant. These fragmental deposits were, however, probably found not far from some ancient volcanic vent. No indications of such volcanoes were actually observed ; but there are many high peaks and cones visible across the plateau, some of which may prove, on more careful examination than we were able to give, to be portions at least of the ancient craters. At the same time the country has been subjected to such a vast amount of denudation that it is only barely possible that any of them should retain their original form.

Ferruginous Wackenite, or "Wackenite Dolerite," is a rock which caps the summit of Mt. Napier. It is deep red in colour and somewhat columnar in structure. When broken into it appears like a mass of somewhat pebbly red hematite, but it is simply the result of the gradual decomposition of the basalt which forms this hill. This wackenite cap is 20 or 25 feet thick.

Other basaltic rocks of undetermined age occur in the same neighbourhood ; there are, however, very good reasons for believing that they belong to the same geological period as those last described. Mr. E. T. Hardman thus describes these rocks :—

Along the Western and Southern extremity of the Leopold Ranges a band of trap rock, about a quarter to half a mile in width, occurs. It has been traced from Mt. Phillip to Mt. Huxley, and is again seen in a deep gorge, which apparently cuts right through these hills, passing a quarter of a mile North of Mt. Huxley and continuing in an East-South-Easterly direction for about four miles. This chasm, which was named Straith-na-diaoul, is cut through quartzites and altered grits to the underlying trap rocks, which are about 500 yards wide ; and these, as well as the band outside the range, have evidently been forced up long after the stratified rocks were deposited, as may be inferred from the manner in which

Digitized by Google

those stratified rocks have been contorted and tossed about in the immediate vicinity of the traps. Here the traps pass from diorites into dolerites, and *vice versa*. Similar rocks are seen at the upper end of the gorge through which the Margaret passes, at J 11, where these basaltic rocks are seen in the river bed, and in the precipitous river walls for more than one-and-a-half miles, and in places for more than a quarter of a mile in width. That this basaltic outburst is of later date than that of the overlying rocks is certain, as the latter, which belong to the Metamorphic or Lower Silurian (?) system are upheaved by it to a considerable height and greatly contorted in places.

The character of the basalt here is similar in every respect to that near Mt. Huxley, and also to that of the flow basalts of the Antrim plateau. It is highly crystalline in places, and contains large quantities of olivine and epidote, with quartz veins.

Basaltic lavas are also known on the North-West coast to the South of Nullagine, and also on the Fortescue River.

Between Lake Cowan and Widgemooltha the character of the country, according to the researches of Mr. Göczel, late Field Geologist, is such that

All circumstances point out that the diorites in this place are the remains of lava streams which have flowed from a volcanic centre situated between the lakes Lefroy and Cowan, and to which also the formation of a watershed between the two lakes is due.

The same writer also states that

Lake Cowan occupies the depressions of an old volcanic region. . . . Nearly all the surrounding country of that lake consists of amphibolites, old greenstones, felsitic rocks and tuffs. The North-Western shore is approached by gneiss-granite hills, often covered with amphibolites or greenstone cappings. The Palæozoic volcanic rocks become more and more predominant as we approach towards the lake, beneath which the gneiss-granite completely disappears. Along the Western shore of the lake the great break in the archæan strata is most pronounced, and the rugged mountains and hills extending along the shores and forming islands in the lake are ruins of old volcanoes, which, in their time, were of similar build to the strata volcanoes of later periods. *

Basaltic lava is also known at Bunbury; here a mass of columnar basalt rises about 20 feet above sea level. Similar basalt again makes its appearance about five miles to the South of the Capel River. Basalt has also been described as occurring on the South Coast, to the East of Flinders Bay, at Black Point.

Census of Minerals of Western Australia.

By Edward S. Simpson, B.E., F.C.S., Mineralogist and Assayer to the Geological Survey of Western Australia.

In Bulletin 4† of the Geological Survey the author first published a census of the minerals of the State. Since then, several new minerals have been recognised, and a number of additional localities noted, all of which appear in the following list. The commoner rock-forming minerals, such as quartz, felspars, micas, amphibole, etc., have been omitted as before, except where their occurrence is of marked interest either for economic or scientific reasons.

* "Geological Notes and Sketches." S. Göczel. Appendix vi. *Ad interim* Report of the Department of Mines for the half-year ending 30th June 1894. Perth: By Authority 1894, pp. 36 *et seq.*

† The Mineral Wealth of Western Australia. A. Gibb Maitland. Chap. 12, pp. 144-149. Perth: By Authority: 1900.

Digitized by Google

Most of the localities mentioned are to be found on the 45-Mile map of the State, published by the Lands Department in 1900. In order that they may be more readily identified, the goldfield or division of the State in which they are situated is always indicated, the following abbreviations being employed:—

K.—Kimberley G.F.
Pil.—Pilbara G.F.
W.P.—West Pilbara G.F.
Ash.—Ashburton G.F.
Gas.—Gascoyne G.F.
P.H.—Peak Hill G.F.
M.—Murchison G.F.
Yal.—Yalgoo G.F.
E.M.—East Murchison G.F.
M.M.—Mount Margaret G.F.
N.C.—North Coolgardie G.F.
Ygn.—Yilgarn G.F.
C.—Coolgardie G.F.
B.A.—Broad Arrow G.F.
E.C.—East Coolgardie G.F.
N.E.C.—North-East Coolgardie G.F.
Dun.—Dundas G.F.
P.R.—Phillips River G.F.
Dk.—Donnybrook G.F.

Localities outside Goldfields.

N.E.—North of 27° South and East of 121° East.
N.W.—North of 27° South and West of 121° East.
S.W. – South of 27° South and West of 121° East.
S.E. — South of 27° South and East of 121° East.

Alunogen (*Hydrous sulphate of aluminium*).—Parker's Range, Ygn.

Anglesite (*Sulphate of lead*).—Gorge Creek, Ash.

Aragonite (*Carbonate of calcium*).—Kanowna, N.E.C.

Arsenopyrite (*Sulpharsenide of iron*).—Ruby Creek, K.; Niagara, N.C. Smithfield, B.A.: Paddington, B.A.; Coolgardie, C.

Asbestos (*Hydrated silicate of magnesium*).—Tambourah (15 miles N. of), Pil.; Jarman Island, N.W.; Upper Henry River, N.W.; Mt. Magnet, M.; Menzies, N.C.; Feysville, E.C.; Hannan's Lake, E.C.

Asbolite (*Hydrated oxide of manganese and cobalt*).—Kanowna, N.E.C.; Kalgoorlie, E.C.; Norseman, Dun.; Kurnalpi, N.E.C.

Atacamite (*Hydrated oxychloride of copper*).—Peninsula, Dun.

Azurite (*Hydrated carbonate of copper*).—Croydon, W.P.; Whim Creek, W.P.; Yalgoo, Yal.; Rothesay, Yal.; Sir Samuel, E.M.; Northampton, S.W.; Narra Tarra, S.W.; Arrino, S.W.; Mt. Misery, S.W.; Murrin Murrin, M.M.; Leonora, M.M.; Broad Arrow, B.A.; Coolgardie, C.; Ravensthorpe, P.R.

Barite (*Sulphate of barium*).—Northampton, S.W.; Denmark, S.W.

Bauxite (*Hydrated oxide of aluminium*).—Wongan Hills, S.W.; Mahogany Creek, S.W.; Smith's Mill, S.W.; Mt. Baker, S.W.; Menzies, N.C.; Bardoc, B.A.

Bismite (*Oxide of bismuth*).—Yalgoo, Yal.

Bismuth (*Native metal*).—Yalgoo, Yal.; Lawlers, E.M.; Burbanks, C.; Dundas, Dun.

Bismuthinite (*Sulphide of bismuth*).—Yalgoo, Yal.

Bismutite (*Hydrated carbonate of bismuth*).—Yalgoo, Yal.; Lawlers, E.M.; Burbanks, C.

Bitumen (*Oxygenated mixture of hydrocarbons*).—Horseshoe, P.H.; Wilgi Mia, Weld Ranges, M.

Blende (*Sulphide of zinc*).—Yandicoogina, Pil.; Croydon, W.P; Geraldine, S.W.; Northampton, S.W.; Cardup, S.W.; Lawlers, E.M.; Coolgardie, C.; Kalgoorlie, E.C.; Norseman, Dun.

Digitized by Google

Bornite (*Sulphide of copper and iron*).—Wyman's, Pil.; Uaroo, Ash.; Gabanintha, M.

Bournonite (*Sulphantimonite of copper and lead*).—Wiluna, E.M.; Kalgoorlie, E.C.

Calaverite (*Telluride of gold*).—Kalgoorlie, E.C.

Calcite (*Carbonate of calcium*)—

(1.) Limestone.—Napier Range, N.W.; Oscar Range, N.W.; Geikie Range, N.W.; Hull Range, N.W.; Fossil Hill, N.W.; Mt. Pierre, N.W.; Range South of Mt. Pierre, N.W.; Mt. Bertram, K.; Mt. Dockerell, K.; Elliot Range, K.; Albert Edward Range, Ord River, K.; Mt. Panton and all along West side of Great Antrim Plateau, K.; Minilya River, N.W.; Gascoyne River, N.W.; Barrow Island and other islands off the North-West coast; Shark Bay, Geraldton, Fremantle, Margaret River, and elsewhere along the West coast; Gingin, Yatheroo, and Dandaragan, S.W.; Israelite Bay, Eyre, Eucla, and elsewhere along the South coast between those points extending inland over 150 miles, etc.

(2.) Crystallised Secondary Calcite.—Hall's Creek, K.; Brockman's, K.; Mary River, K.; Mt. Magnet, M.; Kanowna, N.E.C. Paddington, B.A.; Broad Arrow, B.A.; Kalgoorlie, E.C.; Hannan's Lake, E.C.; Coolgardie, C.; Red Hill, C.; Yallingup and elsewhere in the South-West Cave District, etc.

Cassiterite (*Oxide of tin*).—Head of the Bow River, K.; Head of Lennard River, N.E.; Brockman's Creek, Pil.; Cooglegong Creek, Pil.; Shaw Tinfields (near Eley's Well), Pil.; Greenbushes, S.W.

Cerargyrite (*Chloride of silver*).—Red Hill, C.

Cerussite (*Carbonate of lead*).—Roebourne, W.P.; Mt. De Courcy (10 miles S.E. of), Ash.; Uaroo, Ash.; Gorge Creek, Ash.; Geraldine, S.W.; Northampton, S.W.; Narra Tarra, S.W.

Cervantite (*Oxide of antimony*).—Wiluna, E.M.; Mt. Magnet, M.

Chalcocite (*Sulphide of copper*).—Uaroo, Ash.; Rothesay, Yal.; Murrin Murrin, M.M.; Geraldine, S.W.; Northampton, S.W.; Arrino, S.W.; Ravensthorpe, S.W.

Chalcopyrite (*Sulphide of copper and iron*).—Hall's Creek, K.; Panton River, K.; Ruby Creek, K.; Tambourah, Pil.; Wymans, Pil.; Yandicoogina, Pil.; 20-Mile Sandy Creek, Pil.; Whim Creek, W.P.; Croydon, W.P.; Hong Kong, W.P.; Roebourne, W.P.; Red Hill, Ash.; Uaroo, Ash.; Rothesay, Yal.; Yalgoo, Yal., Geraldine, S.W.; Northampton, S.W.; Wongan Hills, S.W.; Serpentine, S.W.; Sir Samuel, E.M.; Erlistoun, M.M.; Mt. Ida, N.C.; Kalgoorlie, E.C.; Coolgardie, C.; Knutsford, Ygn.; Ravensthorpe, P.R.

Chrysocolla (*Hydrated silicate of copper*).—Croydon, W.P.; Red Hill, Ash.; Mt. Misery, S.W.; Sir Samuel, E.M.; Ravensthorpe, P.R.

Coal (1.) (*Hydrous bituminous coal*).—Upper Irwin River, S.W.; Dongara, S.W.; Collie, S.W.; Dardanup, S.W.; Fly Brook, S.W.

(2.) *Brown Coal*.—Coolgardie, C.; Fitzgerald River, S.W.; Cliffy Head, S.W.

Coloradoite (*Telluride of mercury*).—Kalgoorlie, E.C.

Coolgardite (*Telluride of gold, silver, and mercury*).—Kalgoorlie, E.C.

Copper (*Native metal*).—Roebourne, W.P.; Uaroo, Ash.; Rothesay, Yal.; Geraldine, S.W.; Northampton, S.W.; Mount Scratch, S.W.; Sir Samuel, E.M.; Coolgardie, C.

Covellite (*Sulphide of copper*).—Whim Creek, W.P.; Northampton, S.W.; Arrow Lake, B.A.; Kanowna, N.E.C.

Digitized by Google

Crocoisite (*Chromate of lead*).—Menzies, N.C.

Cuprite (*Oxide of copper*).—Tambourah, Pil.; Whim Creek, W.P.; Red Hill, Ash.; Uaroo, Ash.; Day Dawn, M.; Murrin Murrin, M.M.; Geraldine, S.W.; Northampton, S.W.; Mount Misery, S.W.; Wongan Hills, S.W.; Ravensthorpe, P.R.

Diamond (*Carbon*).—Nullagine, Pil.

Dolomite (*Carbonate of calcium and magnesium*)—

(1.) Dolomite Rock.—Braeside, Pil.; Onslow, N.W.; Millie Soak M.; Goddard's Creek, N.E.C.

(2.) Crystallised Secondary Dolomite.—Goongarrie, N.C.; Bardoc, B.A.; Kanowna, N.E.C.; Kalgoorlie, .E.C.; Hannan's Lake, E.C.; Coolgardie, C.

Elaterite (*Oxygenated hydrocarbon*).—Cranbrook, S.W.

Electrum (*Alloy of gold and silver*).—Donnybrook, S.W.

Emmonsite (*Hydrated tellurite of iron*).—Kalgoorlie, E.C.

Enargite (*Sulpharsenate of copper*).—Kalgoorlie, E.C.

Epidote (*Silicate of calcium, aluminium, and iron*).—Mary River, K.; Ramsay Range, near Margaret River, K.; Synnott Creek, N.W.; Broad Arrow, B.A.; Kalgoorlie, E.C.; Southern Cross, Ygn.; Mundaring, S.W.; Donnybrook, S.W.

Epsomite (*Hydrous sulphate of magnesium*).—Lake eight miles North of Kanowna, N.E. '.; and many other salt lakes of the Southern interior.

Fluorite (*Fluoride of calcium*).—Kalgoorlie, E.C.

Fuchsite (*Silicate of aluminium, chromium, and potassium.*)—Roebourne, W.P.; Kalgoorlie, E.C.

Gadolinite (*Silicate of iron, beryllium, and yttrium*).—Cooglegong Creek; Pil.

Galena (*Sulphide of lead*).—Hall's Creek, K.; Mt. Dockerell, K.; Brockman's, K.; Panton River, K.; Ruby Creek, K.; Tambourah, Pil.; Warrawoona, Pil.; Roebourne, W.P.; Uaroo, Ash.; Mt. Edith, Ash.; Mt. De Courcy, Ash.; Yannerie River, N.W.; Hardey River, Ash.; Gorge Creek, Ash.; Horseshoe, P.H.; Nannine, M.; Geraldine, S.W.; Northampton, S.W.; Oakagee, S.W.; Narra Tarra, S.W., Cardup, S.W.; Erlistoun, M.M.; Menzies, N.C.; Coolgardie, C.; Norseman, Dun.; Southern Cross, Ygn.

Garnet (*Almandine, silicate of iron and aluminium*).—Upper Lennard River, K.; Northampton, S.W.; Donnybrook, Dk.; Greenbushes, S.W.; Albany, S.W.; Ellensbrook, S.W.; Parker's Range, Ygn.; Ravensthorpe, P.R.

Gold (*Native metal*):—

Kimberley G.F.—Hall's Creek, Brockman's, Mt. Dockerell, Ruby Creek, Panton River, Mt. Coghlan, Mt. Bradley.

Pilbarra G.F.—Marble Bar, Nullagine, Lalla Rookh, Boodalyerrie Creek, Elsie Creek, Cooke's Creek, Mosquito, Yandicoogina, 20-Mile Sandy Creek, Warrawoona, Bamboo, Talga Talga, Tambourah, North Pole, North Shaw, Western Shaw, Middle Creek, Salgash, Just-in-Time, Head of Turner River.

West Pilbara G.F.—Egina, Hong Kong, Pilbara, Mallina, Peewah, Towranna, Croydon, Roebourne, Upper Nickol, Lower Nickol, Station Peak.

Ashburton G.F.—Gorge, Top Camp, Mt. Mortimer, Hardey River, Tannaradgie, Dead Finish, Soldier's Secret, Tooree, McKenzie's

Digitized by Google

Gascoyne G.F.—Bangemall, El Dorado.

Peak Hill G.F.—Peak Hill, Ravelstone, Wilgeena.

Mt. Maitland.—Horseshoe.

Murchison G.F.—Cue, Day Dawn, Mainland, Island (Lake Austin), Gabanintha, Burnakura, Nannine, Meekatharra, Abbotts, Garden Gully, Munara, Mt. Magnet, Cuddingwarra, Boogardie, Lennonville, Weld Range, Quins, Tuckanarra, Webbs, Mulleta.

East Murchison G.F.—Lawlers, Sir Samuel, Wiluna, Barlow's, Kingston, Mt. Pascoe, Darlôt, Ogilvie's, Kathleen Valley, Anderson's, Wilson's, Mt. Clifford, Mt. Zephyr.

Mt. Margaret G.F.—Monowai, Erlistoun, Mt. Clarke (Ogilvie's), Mt. Varden, Cork Tree, British Admiral, Laverton, Mt. Barnicoat, Merolia, Jubilee, Childe Harold, Euro, Hawk's Nest, Mt. Margaret, Mt. Morgans, Korong, Redcastle, Waverley, Murrin Murrin, Mt. Abednego, Benalla, Cardinia, Randwick, Mertondale, Australian Peer, Malcolm, Malcolm Creek, Leonora, Mt. George, Dodger's, Middlesex, Kurrajong, Doyle's Find, Mt. Stirling.

Yalgoo G.F.—Yalgoo, Bilberatha, Noongal, Pinyalling, Lang's, Bates', Gullewa, Ederga, Carlaminda, Cumberland, Woodley's, Rothesay, Mt. Singleton, Nancarrong, Nynghan, Wadgingarra, Mugga Mugga, Naiaunda, Field's Find, Cagacarroon.

North Coolgardie G.F.—Mt. Wilga, Linden, Eucalyptus, Pyke's Hollow, Pennyweight Point, Yundamindera (Granites), Edjudina, Quondong, La Tosca, Yerilla, Armidale, Tampa, Kookynie, Niagara, Menzies, Woolgar, Goongarrie, Isabel, Mt. Ida, Riverina, Mulline, Ularring, Mulwarrie, Davyston, Callion, Comet Vale, Pingin.

Yilgarn G.F.—Mt. Jackson, Knutsford, Southern Cross, Parker's Range, Jacolettis, Yellowdine, Hope's Hill, Duladgin, Mount Caudan, Blackbourne, Mt. Rankin, Greenmount.

Coolgardie G.F.—Coolgardie, Burbanks, Londonderry, Bullabulling, Gibraltar, Gnarlbine, Red Hill, Widgiemooltha, Bonnievale, Kundanna, Barwon, Kunanalling, Kintore, London, Dunn's, Dunnsville, Carbine, Balgarrie, Grant's, Mascotte, Cashman, Carnage Christmas Reef, Siberia.

Broad Arrow G.F.—Bardoc, Broad Arrow, Paddington, Windanya, Black Flag, Dixie.

East Coolgardie G.F.—Kalgoorlie, Boulder, Feysville, Binduli Boorara, Waterfall, Block 45, Block 50.

North-East Coolgardie G.F.—Kanowna, Kurnalpi, Bulong, Ballagundi, Mt. Monger, Taurus, Garibaldi, Wellington, Vosperton, Lindsays, Mulgarrie, Mt. Eba, Black Hills, Sudden Jerk, Mulgabbie, Jubilee, Gordon, Camelia.

Dundas G.F.—Dundas, Norseman, Peninsula, Mt. Kirk, Mt. Deans, Buldania.

Phillips River G.F.—Ravensthorpe, Harbour View.

Donnybrook G.F.—Donnybrook.

Localities outside Proclaimed Goldfields.—Greenbushes, S.W.; Blackboy Hill, S.W.; Peterwangy, S.W.; Wongan Hills, S.W.; Kendinup, S.W.; Bindoon, S.W.; Preston River, S.W.

Gold Amalgam (*Alloy of gold and mercury*).—Kalgoorlie, E.C.

Goldschmidite (*Telluride of gold and silver*).—Kalgoorlie, E.C.

Digitized by Google

Graphite (*Carbon*).—Cue, M.; Northampton, S.W.; Kendinup, S.W.; Head of Donnelly River, S.W.; Mounts Brook, S.W.; Oldfield River, S.W.; York, S.W.; Coolgardie, C.; Kalgoorlie, E.C.; Bulong, N.E.C.

Guano (*Mixture of phosphates of calcium with carbonates, etc.*)—Monte Bello, Is., N.W.; Lacepede Is., N.W.; Abrolhos Is., S.W.

Gypsum (*Hydrous sulphate of calcium*).—Oscar Range, K.; Onslow, N.W.; Island (Lake Austin), M.; Menzies, N.C.; Kalgoorlie, E.C.; Boulder, E.C.; Coolgardie, E.C.; Lake Cowan, and most other salt lakes of Southern interior.

Hæmatite (*Oxide of iron*).—Mt. Hardman, K.; Mt. Marmion, K.; Marble Bar, Pil.; Mt. Hale, P.H.; Horseshoe, P.H.; Mt. Beasley, P.H.; Peak Hill, P.H.; Mt. Gould, P.H.; Mt. No Name, P.H.; Weld Range, M.; Munara Hills, M.; Montagu Range, E.M.; Red Hill, Ash.; Mt. Narryer, N.W.; Goomalling, S.W.; Greenhills, S.W.; Blackboy Hill, S.W.; Cookernup, S.W.; Bridgetown, S.W.; Mt. Jackson, Ygn.; Parker's Range, Ygn.; Kalgoorlie, E.C.; Bardoc, B.A.; Mulgarrie, N.E.C.

Halite (*Common salt, chloride of sodium*).—All the salt lakes in the Southern interior; Rottnest Island, S.W.

Halloysite (*Hydrated silicate of aluminium*).—Norseman, Dun.

Hausmannite (*Oxide of manganese*).—Broad Arrow, B.A.

Hypersthene (*Silicate of iron and magnesium*).—Margaret River, K.; Northam, S.W.; Greenhills, S.W.; Bardoc, B.A.

Ilmenite (*Oxide of iron and titanium*).—In all the more basic igneous rocks of the State, as well as in most river sands. Largely developed at Fitzroy River, K.; Greenbushes, S.W.; Mt. Barker, S.W., etc.

Iron Meteoric (*Mixture of alloys of iron and nickel*).—Meteoric irons have been found at Hamersley Range, N.W.; Ballinoo, M.; Mooranoppin, S.W.; Wogerlin Spring, Youndegin District, S.W.

Jamesonite (*Sulphantimonite of lead*).—Mt. De Courcy, N.W.

Kalgoorlite (*Telluride of gold, silver, and mercury*).—Kalgoorlie, E.C.

Kaolin (*Hydrated silicate of aluminium*).—Very pure at Menzies, N.C. Kanowna, N.E.C.; Collie, S.W.; and elsewhere.

Lepidolite (*Fluosilicate of aluminium, potassium, and lithium*).—Londonderry, C.; Cocanarup, P.R.; Ravensthorpe, P.R.

Limonite (*Hydrated oxide of iron*).—Found everywhere throughout the State. Some more important localities are:—Rough Range, K.; East of Mt. Elder Range, K.; Poondanah, Pil.; Whim Creek, W.P.; Gibson's Desert, N.E.; Peak Hill, P.H.; Wongan Hills, S.W.; Greenhills, S.W.; Mt. Baker, S.W.; Mahogany Creek, S.W.; Greenbushes, S.W.; Herdsman's Lake, S.W.; Mt. Jackson, Ygn.; Parker's Range, Ygn.; Murrin Murrin, M.M.; Menzies, N.C.; Vosperton, N.E.C.; Mulgarrie, N.E.C.; Kalgoorlie, E.C.; Coolgardie, C.; Bardoc, B.A.; etc.

Löllingite (*Arsenide of iron*).—Kalgoorlie, E.C.

Magnesite (*Carbonate of magnesium*).—Menzies, N.C.; Kanowna, N.E.C.; Bardoc, B.A.; Kalgoorlie, E.C.; Hannan's Lake, E.C.; Coolgardie, C.

Magnetite (*Oxide of iron*).—Lodestone Hill, K.; Paradise, S.W.; Darling Ranges, near Pinjarra, S.W.; Collie River, S.W.; Katanning, S.W.; Ravensthorpe, S.W.

Digitized by Google

Malachite (*Hydrated carbonate of copper*).—Devil's Pass, N.E.; Oscar Range, near Brooking Creek, N.E.; Geikie Range, N.E.; Mt. Pierre, N.E.; Muller Range, near Margaret River, K.; Hall's Creek, K.; Panton River, K.; South of Mt. Dockerell, K.; Tambourah, Pil.; Wyman's, Pil.; Whim Creek, W.P.; Roebourne, W.P.; Mons Cupri, W.P.; Croydon, W.P.; Maitland River, W.P.; Upper Nickol, W.P.; Red Hill, Ash.; Uaroo, Ash.; Gorge Creek, Ash.; Horseshoe, P.H.; Mt. Gould, P.H.; Day Dawn, M.; Gabanintha, M.; Yalgoo, Yal.; Rothesay, Yal.; Geraldine, S.W.; Northampton, S.W.; Narra Tarra, S.W.; Arrino, S.W.; Yandanooka, S.W.; Mt. Misery, S.W.; Wongan Hills, S.W.; Sir Samuel, E.M.; Murrin Murrin, M.M.; Leonora, M.M.; Goongarrie, N.C.; Mulline, N.C.; Mt. Ida, N.C.; Boorara, E.C.; Kalgoorlie, E.C.; Coolgardie, C.; Broad Arrow, B.A.; Ravensthorpe, P.R.; Harbour View, P.R.; Middle Mount Barren, S.W.

Molybdenite (*Sulphide of molybdenum*).—Clackline, S.W.; Southern Cross, Ygn.; Coolgardie, C.; Buldania, Dun.

Molybdite (*Oxide of molybdenum*).—Clackline, S.W.

Muscovite (*Silicate of aluminium and potash*).—Developed on a large scale at Tambourah, Pil.; Pyramid Hill, N.W.; Londonderry, C.; Northampton, S.W.; Wagin, S.W.; Mullalyup, S.W.; Greenbushes, S.W.

Opal (*Hydrated silica*)—

(1.) Common opal.—Mooran, P.H.; Yarra Yarra, N.W.; Yundamindera, N.C.; Hannan's Lake, E.C.; Burbanks, C.; Jerramungup, S.W.

(2.) Hyalite.—Mt. Magnet, M.; Bardoc, B.A.; Coolgardie, C.

(3.) Siliceous sinter.—Molygoa Well, P.H.; Bubba Ngundi Creek, M.; Northampton, S.W.; Hannan's Lake, E.C.; Burbanks, C.

Orthoclase (*Silicate of aluminium and potassium*).—In large crystals at Londonderry, C.; Parker's Range, Ygn.; Northampton, S.W.; Albany, S.W.; Collie Quarry, S.W.; Ravensthorpe, P.R.

Petzite (*Telluride of gold and silver*).— Kalgoorlie, E.C.

Psilomelane (*Hydrated oxide of manganese*).—Coolgardie, C.; Murrin Murrin, M.M.

Pyrites (*Sulphide of iron*).—Occurs plentifully in almost every district in the State.

Pyrolusite (*Oxide of manganese*).—Mt. Hardman, K.; Tooncoonarlagee, Pil.; El Dorado, Gas.; Wiluna, E.M.; York, S.W.

Pyromorphite (*Chlorophosphate of lead*).—Geraldine, S.W.; Northampton, S.W.; Narra Tarra, S.W.

Pyrrhotite (*Sulphide of iron*).—Coolgardie, C.; Burbanks, C.; Norseman, Dun.; Knutsford, Ygn.; Southern Cross, Ygn.; Parker's Range, Ygn.; Moora, S.W.

Quartz (*Silica*)—

(1.) Ordinary quartz.—Occurs in every district as a constituent of rocks or veins. Good crystals occur at Mulgarrie, N.E.C.; Kalgoorlie, E.C.; Burbanks, C.; York, S.W.

(2.) Chalcedony.—Widely distributed amongst the older rocks in the form of jasper "bars," as at the Marble Bar, Coongan River, Pil.; Weld Ranges, M.; Hannan's Lake, E.C., etc. Also occurs at Lubbock Range, K.; Mt. Elder Range, K.; Tooncoonarlagee, Pil.; Paddington, B.A., Hannan's Lake, E.C.; Siberia, C.; Londonderry, C.

Digitized by Google

Roscoelite (*Silicate of aluminium, vanadium, etc.*).—Kalgoorlie, E.C.

Rutile (*Oxide of titanium*).—Kalgoorlie, E.C.; Greenbushes, S.W.

Scheelite (*Tungstate of calcium*).—Coolgardie, C.; Southern Cross, Ygn.

Serpentine (*Hydrated silicate of magnesium*).—Occurs in many districts as a product of decomposition of basic rocks, as at Hannan's Lake, E.C.; Coolgardie, C.; Mt. Dick, S.W. *Vide* Asbestos.

Siderite (*Carbonate of iron*).—Cue, M.; Menzies, N.C.; Kanowna, N.E.C.; Vosperton, N.E.C.; Kalgoorlie, E.C.; Hannan's Lake, E.C.; Burbanks, C.

Silver (*Native metal*).—Nannine, M.

Sphene (*Titano-silicate of calcium*).—Coolgardie, C.

Spodumene (*Silicate of aluminium and lithium*).—Ravensthorpe, S.W.

Stibiconite (*Hydrated oxide of antimony*).—Wiluna, E.M.

Stibiotantalite (*Tantalo-niobate of antimony*).—Greenbushes, S.W.

Stibnite (*Sulphide of antimony.*)—Mallina, W.P.: Peewah, W.P.; Wiluna, E.M.; Mt. Magnet, M.

Sulphur (*Native element*).—Peak Hill, P.H.; Mt. Magnet, M.; Burtville, M.M.

Talc (*Hydrated silicate of magnesium*).—Cue, M.; Lennonville, M.; Coolgardie, C.

Tantalite (*Tantalate of iron*).—Greenbushes, S.W.

Tellurium (*Native element*).—Kalgoorlie, E.C.

Tenorite (*Oxide of copper*).—Croydon, W.P.; Hong Kong, W.P.; Red Hill, N.W.; Arrino, S.W.

Tin (*Native metal*).—Greenbushes, S.W.

Topaz (*Fluo-silicate of aluminium*).—Londonderry, C.

Tourmaline (*Silicate of boron, aluminium, etc.*).—Junction of Lennard and Richenda Rivers, K.; Mt. Philip, K.; Brockman's Creek, Pil.; Pinyalling, Yal.; Niagara, N.C.; Widgiemooltha, C.; Northampton S.W.; Bowes, S.W.; Greenbushes, S.W.; Cocanarup, P.R.; Ravensthorpe, P.R.

Turgite (*Hydrated oxide of iron*).—Greenbushes, S.W.

Vanadinite (*Chlorovanadate of lead*).—Mulline, N.C.; Pinyalling, Yal.; Coolgardie, C.

Wolfram (*Tungstate of iron*).—Roebourne, W.P.

Zircon (*Silicate of zirconium*).—Greenbushes, S.W.

Geological Features of the South-Western Caves District.

By Edward S. Simpson, B.E., F.C.S., Mineralogist and Assayer to the Geological Survey of Western Australia.

To the visitor to the Caves, travelling from Busselton to Yallingup or the Margaret River, the geological structure of the district, though extremely simple, is not at once apparent, owing to the surface covering of sand and ironstone gravel. On

Digitized by Google

Busselton one passes for some miles over sandy plains, beneath which, at a shallow depth, limestone is revealed in the beds of creeks and swamps. These plains are succeeded, at Dunnsborough on the Yallingup road, and the Lennox River on the Karridale road, by a low range of granitic rocks, masked by a thin coating of sand and ironstone, which in turn give place to limestone as the West coast is approached.

The oldest rock in the country lying between Capes Naturaliste and Leeuwin is the foliated granite or gneiss forming the range running parallel with the coast between the two capes, and at a distance never exceeding five miles from it. The same rock appears also at numerous points along the sea shore, notably in the vicinity of Ellensbrook. On the coast it is seen to pass under the series of sand-dunes, calcareous sandstones and limestones, forming the so-called "Coastal Limestone Series," in which the caves are situated. Though the latter rocks are naturally of the greatest interest, a few words about the granite will not be out of place, especially as it has played a somewhat important part in the formation of the caves, by directing the underground flow of water into well defined channels.

Originally an igneous rock solidified at some depth beneath the surface, the granite was folded and forced up into approximately its present position by shrinkage of the cooling crust of the globe. This force, acting in an East and West direction, set up in the previously massive rock a foliation in an approximately North and South direction, plainly visible at the Swimming Pool on the Margaret River and elsewhere. At the same time several minerals not originally present in the rock were developed in it, by the action of heat and pressure, particularly black mica, which now appears in broad bands in the rock, and red garnet. The latter is so plentiful in places, and so much more indestructible than the other constituents, that at Ellensbrook and elsewhere parts of the sea beach are composed almost wholly of blood-red grains of it. The granite range ultimately resulting from these earth movements occupied the whole of the country between the West half of Geographe Bay and Cape Leeuwin, and was separated by a stretch of shallow water from the mainland. This strait ran South from the present site of Busselton and Newtown to the South coast East of Augusta, and was subsequently filled in with clay and sand washed down from the ranges and with lime from the shells of marine animals.

Within comparatively recent geological ages, the trade winds have piled up on the top of the granite of the West coast huge quantities of drift sand, composed of fragments of quartz derived from the granite itself, of sea shells left on the beaches by the tides, and, lastly, of myriads of the beautiful microscopic shells of the minute marine animals known to scientists as foraminifera. The proportions in which these different constituents collected have varied considerably in different places, and this has been of consi[illegible] influence in the subsequent cave forming, for quartz sand is

Digitized by Google

of silica, a substance practically insoluble in rain water, whilst the shells of molluscs and foraminifera are composed of carbonate of lime, a substance comparatively readily soluble in it.

Probably owing to the pressure of the increasing accumulation of drift sand, the West coast has gradually sunk until the lower portions of the old granite sea coast have disappeared below the waters, and only what were once the higher cliffs remain standing a few feet above the waves. The rain falling on the sand-dunes during the wet season dissolved part of the carbonate of lime out of the shell fragments at the surface, and, sinking into the sand, carried the lime with it until it reached an impervious rock bottom, where it lay until the dry weather set in, and it evaporated off, leaving the lime as a hard cement round the grains of the lower beds of sand. This process has gone on up to the present day, and is still going on, forming those irregular pinnacles of limestone beneath the loose surface sand, which are so common, not only in the caves district, but also in the vicinity of Fremantle. Wherever the shells were most plentiful in the sand, there the proportion of cementing lime was most plentiful also, and, consequently, the resulting rock most compact and strong. It is in such localities that the most beautiful caves are to be looked for. A thin slice of the rock from the surface near the Lake Cave, when examined under the microscope, is seen to be composed of shells of foraminifera, with a few quartz grains cemented by secondary carbonate of lime. Evidences of former vegetation, long since covered up by the sand, are to be seen in the fossil roots abounding in the rock on the sea coast. These are so numerous in places as to give the rock the appearance of coral.

At the same time as the loose sand was being thus consolidated into hard limestone, or softer sandstone, the caves themselves were also beginning to form. The accumulation of sand drift was encroaching on the beds of the streams flowing down from the granite ranges into the sea. The drift was most pronounced in the summer months under the influence of the South-West trade wind, just when the creeks were either dry or else so low as to be powerless to wash away the sand. In this way, one by one, the smaller water-courses were filled in, and, as the latter was cemented into a solid rock, the stream water had to force its way down to the sea by tortuous ways through the most porous parts of it.

The stream water flowing down the granite slopes still contained some of the carbonic acid, by virtue of which the rain was able to dissolve the carbonate of lime of the shells. It also, therefore, dissolved portion of the lime from the sands first met with, carrying this further into the bowels of the earth. There, no doubt, portion of it was re-deposited by the evaporation of the water, but by far the greater part (the water being prevented by the underlying impervious granite from sinking to great depths in the earth) was carried right through the limestone and sand-dunes out into the sea, there to be assimilated by later generations of molluscs and foraminifera.

Digitized by Google

The continual solution of the rock along the lines of flow of the underground water could have but one result, viz., the formation of irregular tunnels in the lower beds of the limestone, starting, for the most part, at or close to the inland junction of the latter with the granite, and terminating on the seaward slope of the limestone hills. As time went on these tunnels were enlarged by two means, first, the solution of the floors and side walls in the running water; second, the breaking down of loose portions of the roof and walls, and the subsequent solution and removal of these fragments. Evidences of the caving in of the roofs are plainly visible to the most casual observer, in all of the caves of this district, and as the limestone is soft compared with, say, the limestone of the Jenolan Cave District of New South Wales, it is this process that has been mainly responsible for the formation of the large chambers. Closer inspection will reveal the evidences of the former agency in the ledges projecting from the walls which represent old floor levels. The Suspended Table at the base of the two large hanging stalactites in the Lake Cave is a stalagmite or floor-formation, from under which the rock has been dissolved out.

The quartz granules in the limestone, being insoluble in the running water, have either been carried away mechanically by it, or left as a deposit on the lowest floors of the caves, as in the chamber of the Crystal Floor in the Yallingup Cave. More or less intermixed with boulders from the roof, it sometimes closes up the underground channels altogether, as at the intake end of the Lake Cave.

The comparative softness of the rock in the Margaret River District has been the cause of a very unique feature of the caves, viz.:—the pit-like entrances to many of them. In softer portions of the rock the collapse of the roof of the caves has gone on until finally the cave reached to within a few feet of the surface, when the whole of it gave way and fell into the cavern, leaving a "roof entrance" in the shape of a more or less circular pit open to the sky, 50 to 200 feet in diameter, with overhanging walls adorned with stalactites. Such pits are to be seen at the entrance to the Lake Cave, Giant's Cave, and the second entrance to the Mammoth Cave, amongst others. The main entrance to the latter cave is a "tunnel entrance" at the intake into the rock of the stream, which has been responsible for the formation of the cave.

Whilst the caves were being thus hollowed out of the hills, Nature was already at work in her own way beautifying them. The material chosen was the carbonate of lime of the limestone, the pigment, the oxide of iron of the same, and the means, the downward soaking rain water charged with carbonic acid. The latter in its downward passage through the porous rock became saturated with lime, and also dissolved varying small quantities of iron oxide. Filtering through into the caves, this highly-charged solution deposited its lime, tinged more or less by the iron, in the form of "stalactites," "shawls," "crystal-floors," or "walls," "stalagmite" and "rock-snow."

Digitized by Google

The stalactite is the most common form of formation, and so we shall trace its history first. In the first place we note that stalactites are confined to the roof on the under side of overhanging ledges. The growth of the stalactites took place in two distinct ways: first, by the formation of a slender hollow tube; second, by the subsequent deposition of successive coats of lime on both inside and outside of this tube. Each drop of water charged with lime which hung from the roof evaporated somewhat before it fell to the floor, and, during that evaporation, deposited a thin ring of lime through which the succeeding drop passed, increasing it somewhat in length and thickness ere it too in its turn fell to the ground. In course of time this resulted in the formation of a more or less long hollow tube of lime of uniform diameter equal to that of a drop of water. The water dripping down this tube continually lengthened it, and at the same time kept on depositing lime also on the inside of it until the tube was finally completely filled. The second stage of the growth may have been simultaneous with the first, and consisted of a thickening of the stalactite from the outside by the water trickling down over the outside and depositing lime on it. It is this second process which forms the thick butts of the older stalactites, and also the knobbed and otherwise irregularly-shaped ends. Stalactites in all stages of growth can be seen in almost all the caves. So long as water charged with lime continues to trickle over them they maintain a fresh glistening appearance, but as soon as this supply of water fails through any cause, they become dull on the surface. The surplus water dripping from the stalactites of the roof fell to the floor, and there deposited most of the balance of the lime in the form of a stalagmite or floor growth. This stalagmite grew upwards to meet the stalactite as the latter grew downwards, the final result being a column extending from roof to floor.

"Shawls," which are probably the most beautiful form of cave adornment, invariably form on overhanging sloping walls. There the water soaking through from above did not drop direct to the floor, but trickled down the wall by the nearest route to the floor, leaving a thin deposit of lime in its wake. The continual repetition of this process resulted in the formation of a thin sheet of lime projecting from the wall at right angles to it, and banded in beautiful succession of tints according as the proportion of iron in the water varied at different stages in the growth of the shawl.

"Crystal floors" or "walls" are confined to more or less gently sloping surfaces over which a considerable and evenly distributed flow of lime-charged water has taken place. The evaporation and loss of carbonic acid experienced by the water in its flow has caused the deposition of the lime in beautiful crystalline sheets over considerable areas of rock. The Margaret River caves lack apparently one beautiful form of such deposits in the Jenolan Caves, viz.:—The formation on them of a succession of cup-shaped hollows, one beneath the other, in terraces, each hollow full of crystal clear water, a small scale model of the famous White Terrace of New Zealand.

Digitized by Google

On the walls of some caves, where the evaporation has been too rapid for the deposit to assume definite crystalline form, there are large masses of a soft spongy mass of milk-white calcite for which "Rock-snow" would be an appropriate name. This substance occurs in the Wallcliffe and Mammoth Caves, and has been found also in the Imperial Cave at Jenolan.

In their structure, the South-Western caves of this State differ somewhat considerably from the well-known Jenolan Caves of New South Wales. The first difference to strike the person acquainted with both is, that the former are scattered over an enormous area, approximately 60 miles long by one-half to three miles wide, whilst the Jenolan Caves are included in an area of less than one mile long and one-quarter mile wide. The caves at Jenolan are situated one above the other in a narrow ridge of limestone, and have all been hollowed out by the Jenolan River and its tributary, McKeown's Creek. Most of the South-Western Caves are situated at some distance from one another, and have each been formed by a different creek. A final point of distinction is that the South-Western Caves are situated in a comparatively soft foraminiferal limestone of recent age, which has suffered no great disturbance since its formation, whilst the Jenolan Caves are situated in a very compact, flinty coral limestone, in very remote (Devonian) times a coral reef, but since then covered up by other rocks, hardened and finally tilted up into an almost-vertical position.

DESCRIPTION OF THE LIMESTONE CAVES OF WESTERN AUSTRALIA.

By Mr. C. Erskine May, Member of the Caves Board.

The beautiful caves of Western Australia, which have recently attracted so much attention, are situated in the South-Western portion of the State, between Cape Naturaliste and the Leeuwin, in an undulating limestone country which skirts the coast line at a distance varying from half a mile to three miles. This cave country, extending as it does from North to South for some 50 miles, is honeycombed with subterranean galleries, displaying marvellous and beautiful geological features which, according to many persons well qualified to express an opinion, are unrivalled, for their beauty, picturesqueness, and infinite variety, in the Southern Hemisphere, if not, indeed, in the world.

Early History.

Strange as it doubtless appears, though the existence of these caves has been known of for the last 20 years, the extraordinary beauties of this underground wonderland were not brought into prominence until two years ago. A few of the residents of the locality—notably Mrs. John Brockman—were, however, persistent in their endeavours to induce the Government of the day to protect from acts of vandalism the brilliant and fantastic handiwork

Digitized by Google

Nature that lay hidden in their darksome recesses; and on the urgent representations of Mrs. Brockman, the Honourable George Throssell, the then Minister for Lands, caused an exhaustive exploration to be made, with the result that the Government, recognising the value of this marvellous subterranean labyrinth, immediately took steps to insure its future protection. This action was taken none too soon, for it was found that many caves in the most Southerly portion of the district had been irretrievably ruined by evilly-disposed and thoughtless persons. The whole of the district in the vicinity of the caves was, however, at once made a Government Reserve and placed under a board of management, by whose efforts these marvellous caverns, once almost inaccessible, have now been rendered easy of access by the opening up of passage ways, the construction of gradual descents and of bridges across chasms, and other facilities of a like nature.

The Trip.

The route at present usually taken from Perth to the Caves is by railway to Busselton, a picturesque little seaport town, forming a quiet and delightful retreat in itself. It is the terminus of the South-Western Railway, and its distance from Perth is 149 miles. The road track from Busselton to the Caves, for the first 15 miles, practically skirts the foreshore of Geographe Bay, making an exceedingly pretty drive, which winds in and out amongst an avenue of luxuriant Peppermint trees, the view being relieved occasionally by a glimpse of the sea on the one side, and the broad sheets of water of the lagoon on the other. Leaving the Bay, a further five miles travel through picturesque forest country is enjoyably traversed, and the first known Cave of importance is reached.

Yallingup Cave.

This cave is so named after the pretty little rivulet which winds round the base of the Wardanup Hill. On the South side of Wardanup Hill, and about 250 feet above the stream, is the entrance to the cave, which resembles very much a shaft cut through limestone for about 30 feet. Descending the shaft by the easy means of artificial steps, the first chamber met with is one immediately to the right of the landing; it is spacious and dome-like, the ceiling being beautifully ornamented with thickly studded stalactites of a somewhat massive formation; owing, however, to the proximity of this chamber to the main entrance and the consequent effects produced by the varying atmospheric influences, the stalactites do not present that brilliant lustre and whiteness noticeable in those found in other chambers. On the left of the entrance is a much smaller chamber, profusely decorated with pure white fragile stalactites, forming a marked contrast to the chamber last described. These two, however, serve only as an introduction to the brilliant marvels of the galleries beyond. Proceeding about 100 feet on a slight decline, a series of chambers is explored, each one having its own special individual wonders and curiosities. Nature has here been particularly generous of her handiwork, the most fragile and

Digitized by Google

fantastic stalactites of every conceivable shape and variety adorning the walls and ceiling of every chamber. Massive stalagmites, 30 feet and more in circumference, rear their alabaster pillars as if to support the arches high above, their grandeur being rendered all the more pronounced by an intermixture of many objects of the most delicate and fragile beauty. The walls within the "Chamber of Mysteries" are exuberantly decorated with myriads of stalactites of pure white, forming the most lovely and fantastic shapes resembling coral and tracery and carvings of the most cunning workmanship; the graceful folded shawls, semi-transparent, with vandyke edges, and variegated by the chemical action of the water, suggest to the enthusiast the idea that each one is trying to surpass the others in its dazzling radiance.

To explore this cave takes, at the very least, four hours. The principal chambers in it are "The Cascades," The Shawls," "The Little Cavern," which comprises "The Jewel Casket," "The Crystal Floor," where one attains a depth of about 200 feet below the surface, "The Mushrooms," and others.

The distance from Yallingup to the next known cave, remarkable for its beauty, is about 26 miles in a Southerly direction. One road connects all the caves, and this, it may be mentioned, has been carefully selected so as to pass through magnificent forest country, and will, on its completion, form not only a pleasant, but an interesting and instructive drive.

Wallcliffe Cave.

This cave is situated close to the mouth of the Margaret River, and is the oldest known cave that has not been subject to acts of vandalism. It is a rather small cave, but has in several of its chambers remarkably beautiful formations. The stalactites here have become somewhat discoloured, apparently from the dust which has blown in from the entrance, and from the burning of rushes which have been used for lights by explorers. The principal beauties of this cave are the figures which are called "The Poultry and Fruit Show," and a marvellous stalagmite which closely resembles an immense human hand. This cave is now being made accessible more for the sake of old associations than for its intrinsic attractions.

The Blackboy Hollow Cave.

This cave is 1¾ miles South of that at Wallcliffe, and the entrance is similar in some respects to that of the Yallingup, except that the descent by steps is only 18 feet. The chamber opposite to the main entrance contains many massive and fleecy-looking stalactites, and the shelving ceiling is a mass of soft looking coral-like substance. Immediately on passing through the main entrance one becomes impressed with the awesome vastness of this colossal cave; rocks that in some remote period of the world's early history formed portion of the ceiling, now wrenched from their place, lie a jumbled mass in wild disorder on the floor. The privilege, however, of examining the wonderful collection of freaks

Digitized by Google

of nature which lies beyond, more than repays the exertion involved in a scramble over these prostrate giants. Amongst the most remarkable of the wonders met with are "The Broken Column," "The Queen's Crown," "The Organ Pipes," with their crystallised harmonies, and the "Mammoth" stalagmite, on the latter of which the flashlight reveals superb pyrotechnic effects, lighting up the huge mass with the glitter of a thousand diamonds. Most of the stalactites and stalagmites here are of a light amber colour, and form a pleasing contrast to the more delicate icicle-looking marvels hanging from the ceilings and walls This cave is only partly explored, and much remains to be done before its unknown extent and as yet unrevealed treasures can be thoroughly ascertained.

Witchcliffe Cave.

This cave is to be found within about a mile in a South-Westerly direction from the Blackboy Hollow, and is situated on the South side of a high limestone ridge fully one hundred feet above the Boojidup Creek, overlooking what is known as "The Devil's Pool." The entrance to the cave is reached by a rather steep climb, but this once accomplished, the remainder of the exploration is particularly easy. The cave itself is probably the smallest of the group, and has, like the one at Wallcliffe, been known to residents in the vicinity for many years past; and here, also, the use of burning rushes for exploring its recesses has discoloured the handiwork of Nature. This is greatly to be regretted, as it must have originally been one of especial interest. The floors of the various chambers are practically level, and have the appearance of having been cemented, and the most delicate and nervous person can examine their recesses without exertion or fear. The principal objects of interest are "Lot's Wife"—a large stalagmite standing alone in the centre of the chamber—and numerous fleecy-looking stalactites. Further than by placing gates at the entrance, no work of any description has as yet been done here by the Caves Board.

Calgardup Cave.

This cave lies three miles South of the Witchcliffe, its entrance being almost entirely concealed amongst a dense growth of peppermint trees. On entering, after a descent of about one hundred feet, the bed of a subterranean creek is reached, where a narrow little stream, never varying in volume, wanders through its labyrinthine passages without even the murmur of a ripple to break the death-like silence which prevails, animal and insect life being absolutely unknown. Most of the explored chambers in this vast cavern are of indescribable beauty. Within the main dome stalactites innumerable hang from the ceiling and walls like icicles, transparent and pure white. Proceeding thence along a platform five hundred and fifty feet in length, erected to enable visitors to pass dryshod over the damp ground, other chambers are entered and explored. As is the case in the "Blackboy Hollow Cave," some of the stalagmites in this cave are of a light amber colour. Here the chief beauties are: (1) "The Suspended Dome," which is a dome about

Digitized by Google

eight feet long by five feet in diameter at the rim, suspended in mid-air by a stalactite; this most remarkable piece of Natures' handiwork is mainly of amber colour, but on one side, where it resembles fretwork, the carved portions are pure white, thus showing it to a far greater advantage; (2) "The Baptismal Font"; (3) "The Terrace"; and (4) "The Weeping Rock." In a wing off the main entrance is the crowning glory of the cave, namely, the lovely "Meteoric Shower." Here, down in the earth where the light of the stars has never penetrated, are to be seen thousands upon thousands of slender stalactites of varying lengths, pendent from the ceiling, and capped with perfect star-shaped terminals.

The Mammoth Cave.

This cave is three-quarters of a mile South of the Calgardup, and has been given the name of "Mammoth" on account of its majestic proportions and its colossal formations. The entrance to the cave has an Eastern aspect, and, surrounded as it is by an exuberant growth of ferns, roughly hidden amongst the giant trees of Australia—the noble karri—is most charmingly and imposingly situated. Passing through it, an enormous dome is entered, which contains many stalactites of the greatest beauty. This portion of the cave is best seen at night-time, as otherwise the daylight prying through the entrance detracts considerably from the mysterious beauty of the scene within. From the door of the cave to its furthermost recess, wonder after wonder presents itself at almost every step, but throughout the whole of this subterranean fairy-land its bewildering beauties can only be adequately appreciated by those who have had the good fortune to be able to examine for themselves these exquisite specimens of Nature's handiwork. The most prominent features that claim attention are: (1) "The Eagles' Wings," two huge formations which have a most striking resemblance to an eagle with slightly raised wings perched on an immense boulder; (2) "The Tree," a marvellous little stalagmite about three feet in height, with twig-like projections of lateral stalactites growing in a complete circle, the very semblance of a young tree throwing out its branches; (3) "The Cathedral and Organ Pipes," the latter of which not only resemble an organ in form, but on being struck by the hand fill the cavern with clear, melodious notes of a particularly unique and weird sound; and (4), last but not least, this cave possesses "The Mammoth Shawl," which, with its artistically-blended colours, hangs gracefully between two walls, with a careless-looking fold in the centre, its edges being most delicately and beautifully scalloped.

The Lake Cave.

This cave is situated within a mile and a-half from the "Mammoth Cave," and is the only one which has as yet been explored of the Nindup Group, a collection of nineteen caves already known to exist, clustered together within a circle of about two miles in radius. The approach to it is through a deep circular hollow, apparently caused by the subsidence of a portion of its roof. The bottom of this hollow, covering several acres, is filled with a dense mass of ferns and shrubs, particularly luxuriant in appearance, inter-

Digitized by Google

spersed here and there with specimens of the majestic karri, whc towering branches reach slightly above the walls of the hollo Descending by steps for about 300 feet, the first glimpse of tl entrance to the cave is obtained. Before entering, a look upwarc reveals the magnificent sight of enormous circular cliffs, in som places fully 400 feet high, limestone in their formation and of dar appearance, gracefully overhanging, and at one time possibly form ing the walls of a chamber of enormous dimensions. Around thi hollow may yet be seen the huge pillars supporting the limeston arches of the hall, with their old and discoloured stalactites, whicl once formed the original entrance to the cave. The door of thi cave is so narrow that only one person at a time can enter, and stepping on to a platform 250 feet in length, the visitor walks tc the "T" head, where seats have been placed, and here sits awaiting the flash of the magnesium ribbon which reveals a sight of such sublime grandeur that once seen it can never be forgotten. This cavern, which contains one of Nature's greatest masterpieces, is almost a perfect dome, the ceiling and sides of which scintillate with myriads of pointed pendents, the crowning feature, however, being "The Suspended Table," whose dimensions are 15 feet long by 7 feet wide, and about 1in. in thickness. The table is suspended about 2 feet above the middle of the glassy waters of the lake from which the cave takes its name, and is attached at either end to the ceiling by a large stalactite, one of which measures fully 8 feet in circumference. By means of the artificial light, the magic beauty of the table and its icicle-like stalactites are brilliantly reflected in the placid water, and the marvellous spectacle, which resembles, more than anything else, the dazzling oriental splendours of a scene from the "Arabian Nights," alone more than repays the tourist for any possible slight inconvenience he may have been subjected to during the journey to the caves. Words alone, however, avail nothing to convey the slightest idea of the magnificence and sublimity of this underground treasure house. Although the grandeur of the Lake Cave will probably create the most lasting impression on the mind, it is almost absolutely impossible for those who have been fortunate enough to see them to compare the beauties of one cave with another, as each has its own distinctive attractions. For a single effect, however, the universal verdict is in favour of the Lake Cave; whilst for diversity of geological formation the Yallingup Cave probably bears the palm, as also for displaying the greatest variety of exquisitely-shaped objects of delicate and fragile beauty. All the caves are thoroughly well ventilated, and well-known medical men of the highest standing in the State have not only expressed the opinion that no constitution can possibly suffer from an exploration of their wonderful and mysterious recesses, but have gone even further, and have stated that the "climate of the caves district is salubrious, and the country is the ideal health resort of Australia."

Conclusion.

On the near completion of the coastal road connecting all the caves, the drive or ride thither will be full of interest. The coast

Digitized by Google

Digitized by Google

Digitized by Google

line *en route* is most picturesque, and its numerous little bays abound in fish, so that the angler can enjoy himself to his heart's content. The excursionist will always find something of interest, the district possessing almost every *desideratum* for a perfect holiday. The members of the present Government, who have visited the caves, recognise their value as a national asset, and the Ministerial head of the Caves Board (Dr. Jameson), who has personally explored them, is enthusiastic over their beauty, and fully alive to the importance of making the district more attractive and accessible to tourists, which he proposes to effect by the erection of two houses of accommodation, one at Yallingup, and the other at the Mammoth Cave, and by lighting the caves with electricity. The Board anticipate the completion of these works at no very distant date, when the wonderful caves of the South-West of Australia will only have to become better known to form one of the greatest tourist resorts in the Southern hemisphere, if not in the whole world. The district not only offers pleasure and delight to sightseers and the hale and hearty, bent on making holiday, but offers a perfect haven of rest and recovery to invalids and convalescents.

4.—CLIMATE.

(Particulars supplied by the Government Astronomer.)

The Climate of Perth and the South-West and South Coastal Districts.

This district may be roughly considered as bounded by the coastline and by a straight line drawn from Geraldton to Esperance. In taking Perth as representing the whole, the following exceptions should be considered:—

The rainfall is heaviest in the extreme South-West, diminishing thence both Northward and Eastward. It also falls off from the coast or coastal ranges in all directions inland.

The summer is very much cooler on the coast between Bunbury and Albany than elsewhere.

The sea breeze, which makes ordinary hot days bearable in Perth and coastal districts generally, is not felt very far inland. With these exceptions, then, we may consider the climate of Perth as representative of the South-West district.

Perth Climate.

Just as there are two distinct types of weather, so are there two distinct seasons, the winter and the summer. The former sets

Digitized by Google

in, as a rule, rather abruptly, and the dates of the first heavy winter rains in each year may be taken to be as follow :—

FIRST HEAVY WINTER RAINS.

Year.	Winter started.	First heavy rains.	Points.	Remarks.
1880	May 15 ...	May 26 ...	155	Thunderstorm on April 29, with 115 points.
1881	April 22 ...	May 5 ...	72	
1882	April 17 ...	April 19 ...	110	
1883	May 11 ...	May 21 ...	116	Thunderstorm on April 18, with 218 points.
1884	April 29 ...	May 27 ...	126	Perfectly clear 7 to 25 May.
1885	May 9 ...	May 9 ...	98	
1886	May 14 ...	May 15-17 ...	190	4 days' rain, then fine for 3 weeks.
1887	April 24 ...	April 25 ...	62	A lot of fine weather in May and June.
		April 30 ...	90	
1888	April 30 ...	May 1-2 ...	155	Preceded by scattered rains.
1889	May 7 ...	May 8-10 ...	184	Heavy rain April 19-21 (253); thunderstorm April 29.
1890	May 4 ...	May 8 ...	76	
1891	May 2 ...	May 11 ...	115	
1892	April 12 ...	May 23 ...	98	
1893	April 2 ...	April 4 ...	70	Thunderstorm early in March.
1894	May 10 ...	May 14 ...	61	
1895	May 26 ...	May 27 ...	101	Scattered rain throughout April.
1896	April 29 ...	May 8 ...	130	Fine from 10 to 22 May.
1897	May 7 ...	May 14 ...	176	
1898	May 12 ...	May 28 ...	128	
1899	April 12 ...	April 19-22 ...	205	
1900	April 24 ...	May 3-4 ...	146	
1901	April 30 ...	May 1 ...	194	

From May to the end of October may be considered the winter months, and the weather during that time is dominated by the passage of the "highs" and "lows." The average rainfall for each month is as follows :—

May	489	August	579
June	668	September	293
July	595	October...	206

These figures might convey the impression that Perth is a very wet place during the winter, but the reverse is the fact. One of the wettest days that have occurred was 15th June, 1900, and on that occasion the following remarks on the rainfall of Perth and the manner in which it falls were communicated to the daily Press by the Government Astronomer :—

Last Friday (June 15th) was probably one of the wettest days that Perth has ever experienced. The winter rain here generally consists of a series of heavy showers interspersed with fairly long intervals of fine weather. On this occasion, however, there were 9 hours 20 minutes of actual rainfall between 9 a.m. on Friday and 3 a.m. on Saturday, and the total amount registered on Saturday at 9 a.m. for the preceding 24 hours was 265 points. This constitutes a record as far as the Observatory is concerned, and the amount recorded at the Botanical Gardens—viz., 271 points—has only twice been exceeded since the records commenced in 1876. The two

Digitized by Google

exceptions were in July, 1891, when 3 inches fell, and in May, 1879, when 280 points were registered. The actual number of rainy hours during one day has been exceeded only once since pluviometer records commenced in April, 1897. Between last Friday and Saturday mornings at 9 o'clock it was actually raining for 10 hours 12 minutes, and during the day ending 9 a.m., September 30th, 1897, there were 12 hours 48 minutes of actual rainfall; but the total quantity then was only 60 points, and most of this fell during the night. This morning (Sunday) 72 points, and this evening at 6 p.m. 80 points, were registered, making a total of 4 inches and 17 points between Friday morning and Sunday evening. The amount so far recorded for this month is 731 points, or nearly an inch in excess of the average for the whole month for previous years. The greatest quantity ever registered in Perth for the month of June was 12·11 inches in 1890.

Owing to this tendency for the rain to fall principally in heavy showers and at night, and to the sandy nature of the soil, which rapidly absorbs it, the general impression of the Perth winter is that of a succession of fine, bright, calm days, varied occasionally by a severe but brief storm. The weather is, on the whole, delightful, but it may perhaps be too mild. One misses the keen frosty feeling that is experienced in other places, and its absence probably justifies to some extent the popular statement that the climate is enervating.

At night it is frequently cold however, July showing an average of eight nights during which the minimum thermometer in the screen registers below 40 degrees. (As this description of Perth is to be taken as representing more or less the whole of the South-West district, it must be stated that severe frosts are by no means uncommon inland. The coldest part of the State at night is Southern Cross and Katanning, and here the thermometer frequently falls below 32 degrees, especially if exposed to radiation. The mean minimum in the Stevenson screen for July is 38·7 at Southern Cross and 39·3 at Katanning.)

Very severe floods have been occasionally experienced at Perth and elsewhere in past years, but not since systematic records commenced.

The summer does not set in quite so abruptly as the winter. With an occasional hot day in October, it commences generally in November, but does not, as a rule, become really noticeable until after Christmas. Taking a temperature of 90 degrees in the shade as the criterion of a hot day, we find an average of less than 1 in October, 3 in November, 8 in December, 12 in January, 12 in February, 9 in March, and 2 in April. This number (47 in all) seems rather formidable, but the heat is not, as a rule, felt oppressively on account of the short portion of the day during which it lasts on each occasion. On a normal hot summer day a sea breeze always sets in about noon on the coast, and reaches Perth about 2 p.m. The temperature then commences to fall, and the evening and night are delightfully cool and pleasant. Occasionally a protracted spell of hot weather is experienced, but even then the nights are generally cool. The longest of these spells without a break occurred in 1896, when the maximum exceeded 90 degrees on every date between January 25th and February 12th, 19 in all; but the most severe heat was apparently in January and February,

Digitized by Google

1880. The highest reading that has so far been recorded in Perth is 116·7, which occurred in January, 1878.

Notwithstanding the fact that the monthly means are, as a rule, higher than those for the principal cities in South Australia, Victoria, and New South Wales, and that we are in a lower latitude than any of these, the same remark may be applied to the summer climate as to the winter. It appears to be milder than the others. One notices the absence here of those violent changes which are sometimes experienced in the other colonies. When a cool change comes after a spell of hot weather it seems to steal upon the land gradually. The appearance of soft, watery cumulus clouds in the West, generally about sunset, announces the arrival of the welcome change. That evening will be cooler than the preceding ones, but not remarkably so, and next day it may be more or less cloudy, but only moderately cool. At night probably a few light showers, and we realise that a definite change has occurred. Whether or not the sudden changes experienced elsewhere act as a tonic it is difficult to say, but, at all events, they rarely if ever occur in Perth.

A curious instance of uniformity is afforded by the figures showing the average summer temperatures since 1876. One frequently hears the expression "A remarkably cool summer," or "A terribly hot summer," "A real scorcher," etc., yet we find that although the means for the individual months may vary considerably, those for the summer (November to March) diverge but little from the general average. It must be remembered, in studying the following figures, that the thermometers were transferred from one locality to another in August, 1885, and, therefore, the two periods (1876-1885 and 1886-1899) must be studied separately. So uniform, on the whole, are the figures, and so distinct the break, amounting to 2°·1, that by means of it the Government Astronomer was able to ascertain the change in the method of exposure. The following are the mean summer maximum day temperatures, that opposite 1876 being for the period November, 1876, March, 1877, etc.:—

Summer—November to March.	Mean Max. Day Temp.	Divergence from Average.	Summer—November to March.	Mean. Max. Day Temp.	Divergence from Average.
1876 ...	84·5°	—1·5°	1886 ...	82·1°	—1·8°
1877 ...	87·6°	+1·6°	1887 ...	85·1°	+1·2°
1878 ...	86·6°	+0·6°	1888 ...	83·2°	—0·7°
1879 ...	86·2°	+0·2°	1889 ...	83·0°	+0·9°
1880 ...	86·5°	+0·5°	1890 ...	83·6°	—0·3°
1881 ...	86·4°	+0·4°	1891 ...	84·6°	+0·7°
1882 ...	84·8°	—1·2°	1892 ...	84·2°	+0·3°
1883 ...	85·8°	—0·2°	1893 ...	83·1°	—0·8°
1884 ...	84·6°	—1·4°	1894 ...	83·8°	—0·1°
1885 ...	87·0°	+1·0°	1895 ...	85·5°	+1·6°
			1896 ...	83·6°	—0·3°
			1897 ...	84·8°	+0·9°
			1898 ...	83·8°	—0·1°
			1899 ...	83·7°	—0·2°
			1900 ...	84·9°	+1·0°
Mean for this period	86·0°		Mean for this period	83·9°	

Digitized by Google

Climate within the Tropics.

A lengthy description of this is unnecessary; and, unfortunately, our knowledge is derived mainly from coastal stations. The year may be divided into two seasons, wet and dry, the former lasting from the middle or the end of November to the end of March. During this period the weather is very unpleasant, the maximum temperature every day being close to or above 100°. Records of 110° are by no means infrequent, and the thermometer has even reached 120°, the highest reading ever registered in the State being 123°, at Onslow, in February, 1896. As an illustration of the extreme heat to which this region is sometimes subject, the following figures for the summer of 1895-96 will doubtless prove interesting:—

Mean monthly maximum temperature at Onslow:

October, 1895	100·5deg.
November „	101·3 „
December „	106·1 „
January, 1896	103·0 „
February „	105·9 „
March „	104·0 „
April „	99·6 „

Daily maximum temperature at Onslow during two very hot periods:

1895.				1896.			
December	2	...	102deg.	February	9	...	101deg.
„	3	...	109 „	„	10	...	111 „
„	4	...	113 „	„	11	...	112 „
„	5	...	111 „	„	12	...	114 „
„	6	...	108 „	„	13	...	117 „
„	7	...	106 „	„	14	...	116 „
„	8	...	109 „	„	15	...	121 „
„	9	...	106 „	„	16	...	123 „
„	10	...	109 „	„	17	...	116 „
„	11	...	109 „	„	18	...	112 „
„	12	...	111 „	„	19	...	110 „
„	13	...	115 „	„	20	...	108 „
„	14	...	112 „	„	21	...	101 „
„	15	...	110 „	„	22	...	99 „
„	16	...	115 „	„	23	...	116 „
„	17	..	111 „	„	24	...	101 „
„	18	...	99 „	„	25	...	100 „
„	19	...	112 „				
„	20	...	121 „				
„	21	...	104 „				

This is of course an extreme case, but one can now understand that occasionally a press telegram from these very hot districts has appeared in the daily papers to the following effect:—"A delightful cool change has set in; the shade temperature has dropped to below 100deg."

Thunderstorms, accompanied by heavy rain, are frequently experienced, and it is during this season that the willy-willy occasionally visits the N.W. coast. A moderate rainfall can generally be relied upon down to about latitude 20deg., but South

Digitized by Google

of that it is uncertain. Sometimes it will be very heavy, and at other times hardly a drop will fall. The heaviest ever recorded was 36·49 inches at Whim Creek, near Cossack, on April 2-3, 1898.

The most severe drought occurred between June, 1890, and January, 1892, during the whole of which period (20 months) only 73 points of rain were recorded as the mean for the Cossack district.

In the winter months or dry season, the climate is considered by the inhabitants to be most enjoyable. An occasional wet day is experienced, but the weather is for the most part fine, clear, calm, and pleasant.

Climate of the Interior.

It is only within the last few years that any meteorological records have been obtainable from the interior districts of the State, and upon these it is hazardous to found a very definite opinion as to the climate. Up to the end of 1899, for instance, the possible occurrence of such a succession of wet, stormy days as were actually experienced in 1900 would scarcely be credited.

The climate is a mixture of the two already described. Sometimes the tropical rains come across; sometimes the winter storms of the South-West and Southern districts extend well inland, and sometimes both sources of rain fail, and a drought ensues. In the summer it is a climate to be endured as patiently as possible. On the Coolgardie goldfields the heat waves are varied by the cool changes, which pass from West to East along the South coast, but from the Murchison, Northwards, the heat is very disagreeable indeed, whilst the inhabitants as a rule find all the recognised languages quite inadequate for a description of the flies and dust.

As a kind of compensation, the winter season is delightful. Very little rain falls, and the weather is cold, clear, and bracing.

All through the summer occasional thunderstorms may be looked for, and it sometimes happens, as already described, that monsoonal rains come right through this district from the North-West to South-East. The most severe and continuous of which we have any record occurred in March and April, 1900, but geological signs seem to indicate that heavy floods have occurred in past years. The following brief description was written at the end of April, and was supplemented later by a table showing daily rainfall throughout April at selected stations. The description is here reproduced, and also the table, but somewhat further curtailed:—

This month will long be remembered as the month of the great floods. These have been so severe that telegraph lines are interrupted all North of Geraldton, and the postal service in the interior is completely demoralised. The extensive dry plains are now converted into inland seas or lakes, and the rivers have become raging torrents. Peak Hill and Lake Way Stations, situated in the great inland desert, are completely cut off from all food supplies, and it is proposed to shortly hold a regatta at the latter place, where a boat can now sail a course of 70 miles. It will be easily understood that our reports are but few, and, therefore, we are unavoidably obliged to postpone a full account of the rainfall until later. It was of a monsoonal character, and travelled from the North-West coast, in a more or less South-

Digitized by Google

Easterly direction, towards the head of the Great Australian Bight. It may be said to have first set in on the 2nd of March, a detailed account of a heavy storm being given in last month's notes. After the main storm passed away, the weather continued unsettled, with occasional showers throughout the remainder of the month. Rain re-commenced in earnest on the 1st of April, and from then till the 20th a dense cloud-bank enveloped nearly the whole of Western Australia, and the rain was almost incessant. We have, unfortunately, but scanty records from which to make a comparison with past years, but, from all that can be gathered, the present fall has been the heaviest, most general, and most persistent ever known, and no man living has ever seen the country flooded to the same extent. The barometric conditions accompanying the rainfall were as follow:—Although the weather was cloudy and showery throughout the first 20 days of the month, there were three periods of maximum intensity—viz., on the 2nd to 4th, 10th to 12th, and 15th to 17th. During each of these periods a "high" was traversing the South coast from West to East, with falling gradients, thence towards the North-West coast. In the first period a "low" made its way down the West coast from tropical latitudes to the neighbourhood of Geraldton, when it passed inland and travelled across to the Bight. It was of no great intensity, and all the heavy rain preceded it. In the second period there were again signs of a "low" out to sea off the North-West Cape, but this never developed. During the third period (15th to 17th) a "low" apparently passed rapidly across from the North-West Cape to the Bight; but, in this case again, the fall in the barometers was inconsiderable. During nearly the whole 20 days the winds throughout the Colony were from the Eastward, but there can be little doubt that all the rain came from the North-West, although the country observers were not sufficiently versed in cloud observations to make this point certain. The cloud area just escaped Perth, and we were able to see the edge of it, day after day, peeping over the Darling Ranges. The weather here was mostly fine, but unpleasant, with strong Easterly winds, and only a few points of rain. On the 23rd the character of the weather showed signs of a complete change. Our remarks on the map for that morning stated:—

> "To-day's weather reports appear to indicate that the character of the season is abruptly changing from summer to winter. There are now signs of the first winter type of "low" approaching the South-West coast, and the monsoonal rains that have been so exceptionally heavy throughout the interior seem to have now ceased."

This was verified later. The barometer fell rapidly to 29·674 at 3 p.m. on the 24th, with a heavy North-West gale. The anemograph recorded a total horizontal motion of 150 miles between 9 a.m. and noon, and 955 miles for the 24 hours ending midnight, 24-5th, this being the greatest total yet registered. At Cape Leeuwin the barometer fell to 29·205 at noon on the 25th, and the total motion of the wind for the 24 hours was 1,165 miles. The usual winter rains accompanied the passage of this disturbance, giving the Coolgardie fields even yet another downpour.

Digitized by Google

DAILY RAINFALL THROUGHOUT

Stations.	1	2	3	4	5	6	7	8	9	10	11	12	13
Wyndham	5	...	...	...	...	...	...	...	...	...	...	...	..
Hall's Creek	...	...	...	...	...	...	...	...	...	...	...	11	..
La Grange Bay ...	...	2	5	103	58	...	...	...	...	...	...	...	..
Condon	...	...	22	450	5	...	...	...	...	...	...	...	..
Marble Bar	10	...	...	91	29	...	...	...	...	...	...	...	..
Cossack	...	...	10	116	115	...	...	...	2	...	...	...	13
Onslow	...	227	95	83	...	...	...	...	69	45	80	62	35
Carnarvon	56	125	165	63	...	...	...	...	...	...	105	27	..
Hamelin Pool	15	...	10	7	...	...	...	...	...	...	3	1	
Peak Hill	...	17	176	37	9	...	...	...	3	15	28	203	3
Abbotts	...	52	221	10	54	...	...	...	...	39	116	237	23
Mileura	...	62	258	30	58	...	...	...	...	...	86	136	5
Murgoo	...	14	27	22	...	...	...	...	...	167	8	32	
Nannine	...	21	130	140	50	...	...	...	...	4	208	160	..
Cue	...	22	58	152	31	...	...	...	...	...	129	39	13
Mt. Magnet	...	...	3	93	68	...	10	...	...	...	62	13	..
Challa	...	...	...	...	145	...	...	...	...	...	50	...	..
Yalgoo	...	...	...	80	87	2	...	...	...	...	47	...	
Northampton	...	...	...	38	25	31	...	...	...	...	4	11	1
Geraldton	...	...	...	20	17	2	...	...	...	...	38	...	2
Walebing	...	...	...	...	10	2	...	...	...	...	...	...	
Perth Observatory ...	...	...	...	...	1	...	...	...	...	...	...	...	..
Pinjarra	...	...	...	...	20	...	...	...	...	...	...	...	..
York	...	...	...	...	5	4	...	...	...	...	...	...	..
Bunbury	...	...	...	...	...	...	...	...	...	...	...	...	..
Bridgetown	...	...	...	...	...	...	...	...	...	...	...	...	..
Katanning	...	...	...	...	...	...	...	...	...	2	...	...	..
Albany	2	13	7	24	17	5	1	2	13	...	...	...	
Lake Way	...	291	102	55	2	...	...	40	68	159	132	275	..
Lawlers	...	...	24	101	115	3	...	...	...	...	157	56	3
Mt. Malcolm	...	...	...	72	38	22	...	...	...	...	22	51	2
Laverton	...	...	...	...	121	162	...	...	...	...	23	68	8
Pendennie	...	...	...	90	59	16	...	...	6	...	26	26	3
Menzies	...	...	5	7	41	1	...	...	9	...	6	12	9
Goongarrie	...	...	...	6	75	8	...	...	...	...	...	3	3
Kurnalpi	...	...	2	2	92	14	3	...	...	...	...	...	..
Kalgoorlie	...	...	3	6	61	27	...	...	8	12	...	...	..
Coolgardie	...	...	1	9	72	17	1	...	1	...	...	...	..
Widgiemooltha ...	...	...	1	1	98	13	13	...	...	6	...	...	..
Norseman	...	...	...	60	8	8	...	...	4	...	...	...	
Southern Cross ...	...	...	...	...	23	9	...	...	25	...	...	...	..
Mt. Jackson	...	...	...	20	150	8	...	...	...	...	...	...	..
Burracoppin	...	...	...	...	15	28	...	...	...	...	...	...	..
Wattoning	...	...	...	...	...	...	...	...	...	...	...	...	..
Coconarup	...	20	...	...	22	19	...	5	3	4	...	...	1
Esperance	...	...	5	...	20	50	1	6	8	...	...	...	
Israelite Bay	...	...	2	15	67	50	...	...	...	...	...	...	..
Balladonia	...	...	...	...	88	40	9	5	8	...	...	...	..
Eyre	...	20	...	...	6	5	14	1	3	6	...	...	

... Signifies "nil." 100 points equal one inch.

Digitized by Google

THE STATE FOR APRIL, 1900.

14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total.
...	...	...	113	...	...	...	...	...	...	...	...	...	...	...	...	...	118
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11
...	...	...	...	...	38	...	...	...	...	...	...	...	...	...	...	...	206
22	80	45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	624
13	130	139	2	...	...	...	...	...	...	...	...	...	...	...	...	...	414
102	689	1,323	17	...	...	...	...	...	...	...	...	...	...	...	...	...	2,506
...	15	21	7	...	...	...	40	...	...	...	...	...	...	...	...	...	1,100
...	...	...	17	...	...	25	49	...	...	3	12	...	...	...	...	...	647
...	...	...	...	...	...	...	...	...	...	...	50	...	...	...	...	...	87
5	6	167	110	...	...	39	125	...	...	...	...	8	8	...	...	2	988
9	19	114	4	...	...	12	75	16	...	...	...	2	...	...	..	...	1,218
...	36	30	...	...	...	...	65	...	...	...	...	...	...	...	...	...	811
60	...	...	...	...	...	...	...	..	...	42	...	...	...	...	...	2	376
25	...	...	...	...	...	18	45	...	...	...	...	...	...	...	...	...	801
...	225	17	...	...	...	14	5	...	...	...	6	...	...	...	...	...	832
...	27	53	...	...	...	2	...	3	27	...	...	...	...	...	...	...	361
60	...	25	...	...	...	10	...	...	...	19	...	...	...	...	...	...	309
...	...	...	...	...	...	...	...	...	...	7	47	...	...	...	...	...	274
...	...	...	...	...	...	...	2	...	...	29	123	...	...	...	...	..	275
.	21	9	...	...	...	...	12	...	...	33	124	1	5	...	...	...	305
...	14	3	...	...	...	...	...	...	...	6	100	13	8	...	...	...	157
..	3	2	...	...	...	...	...	...	...	8	42	50	25	...	...	...	131
...	...	...	...	...	...	...	...	...	...	5	100	65	10	...	...	...	200
..	...	12	5	...	...	...	...	...	...	26	60	14	11	...	...	...	137
...	...	1	...	...	...	...	...	...	...	6	82	90	10	...	...	...	189
...	3	...	1	...	...	...	...	...	...	...	93	114	5	...	...	5	221
...	...	14	5	...	...	...	...	...	...	...	42	30	...	...	...	9	102
10	1	10	4	11	...	...	...	...	...	...	36	72	53	1	...	2	289
72	207	113	...	178	134	244	...	...	...	...	3	...	...	...	...	...	2,075
22	67	107	36	...	...	46	26	...	...	1	2	...	...	...	...	...	799
8	3	80	57	...	8	87	29	...	...	2	...	5	...	...	...	...	506
11	15	71	79	...	...	..	171	...	...	...	...	...	...	...	...	...	805
25	..	50	67	...	...	13	6	...	...	...	...	...	...	...	...	...	419
23	...	31	60	...	...	72	2	...	...	1	...	...	...	...	...	...	325
21	...	16	35	...	...	25	...	...	...	16	...	...	...	...	...	...	241
24	...	16	21	...	...	40	...	13	...	..	10	7	...	...	...	...	244
26	..	22	30	...	...	7	72	3	...	14	52	...	...	...	...	...	343
10	...	24	42	...	...	...	103	5	...	5	66	..	...	...	...	...	356
9	...	33	43	...	...	39	44	25	...	...	34	...	...	...	...	...	359
.		28	51	...	...	5	21	...	3	...	43	...	2	..	...	...	242
..	6	85	15	...	...	...	...	...	...	27	70	...	...	...	...	...	260
..	..	71	12	...	...	...	10	...	...	...	52	...	...	...	...	...	323
.	15	88	7	...	...	...	...	...	...	17	103	9	5	...	...	...	287
	...	...	...	120	...	...	...	...	...	...	...	80	...	...	...	...	200
23	57	98	6	...	...	6	26	11	...	...	62	...	...	4	...	...	382
12	..	1	33	4	...	3	102	10	...	2	84	...	4	6	...	...	390
50	..	3	47	5	...	6	108	...	6	...	23	...	...	...	...	...	352
12	...	...	32	...	...	51	114	7	...	...	12.	4	...	...	...	...	382
6	...	...	37	2	...	...	198	40	...	...	...	5	...	22	2	...	368

... Signifies "nil." 100 points equal one inch.

Digitized by Google

Mean Maximum Day Temperatures at the Chief Observing Stations in Western Australia during 1901.

	Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.	Highest recorded	Date.
N.W. and N. Coast.	Wyndham ...	102·3	95·6	95·7	96·2	92·6	88·1	85·1	88·4	93·9	100·0	98·1	100·5	94·7	111·8	Jan. 7
	Derby	99·5	94·3	98·2	98·8	91·9	84·9	84·0	87·3	76·2	97·3	98·6	99·9	94·2	109·2	Dec. 3 and 4
	Broome ...	93·2	88·3	93·3	95·4	90·0	78·8	78·4	81·7	88·5	92·8	94·0	94·7	89·1	107·5	Dec. 23
	Condon ...	96·4	92·8	—	—	85·9	75·2	75·9	77·7	85·6	92·5	96·1	98·1	—	112·8	Dec. 7
	Cossack ...	100·1	96·0	93·7	94·0	86·4	75·1	71·8	79·5	87·2	93·0	99·3	100·7	89·7	111·2	Dec. 6
	Onslow ...	101·4	95·5	94·2	95·6	85·5	76·0	74·7	79·3	85·8	88·2	97·3	96·2	89·1	115·2	Jan. 9
	Carnarvon ...	88·0	88·7	90·6	82·3	80·2	73·1	72·2	73·0	74·8	80·0	82·3	82·7	80·7	109·7	Jan. 1
	Hamelin Pool	100·2	97·1	94·2	87·5	78·6	71·0	68·8	71·0	77·9	82·9	91·1	92·5	84·4	112·0	Feb. 4
	Geraldton ...	80·9	85·8	86·6	80·1	73·7	69·7	68·4	68·6	70·5	73·1	76·9	76·7	75·9	103·1	Feb. 14
Inland.	Hall's Creek ...	104·5	94·4	91·9	90·5	85·7	79·0	77·1	84·1	92·6	97·0	101·1	104·2	91·8	108·8	Jan. 7
	Marble Bar ...	—	97·3	96·5	97·6	89·2	75·7	72·6	82·7	92·1	98·8	107·4	109·2	—	—	—
	Nullagine ...	106·5	93·9	91·5	93·3	84·7	72·6	68·7	79·3	89·1	95·2	104·2	106·5	90·4	113·0	Dec. 7
	Bangemall ...	108·0	99·5	94·1	94·0	82·2	72·0	69·6	77·3	84·3	89·5	100·3	109·8	89·3	114·0	Jan. 22 and 23
	Peak Hill ...	103·9	90·7	88·4	89·6	76·0	66·2	64·7	72·3	79·9	85·1	96·5	100·0	84·4	109·7	Jan. 23
	Wiluna ...	—	—	—	—	—	—	—	72·5	79·1	85·3	97·3	101·0	—	—	—
	Cue	104·6	93·7	89·8	90·4	76·9	68·5	66·9	72·7	79·0	85·3	96·0	99·4	85·3	114·0	Jan. 23
	Yalgoo ...	102·0	94·5	89·6	88·8	74·0	67·6	64·6	79·6	76·5	83·8	93·2	96·3	83·4	114·0	Jan. 22
	Lawlers ...	100·1	87·5	84·9	85·8	73·5	65·6	61·9	70·5	77·3	84·3	95·0	98·9	82·1	110·4	Dec. 25
	Laverton ...	96·0	85·2	84·1	82·9	73·2	64·4	61·7	68·0	76·1	83·4	94·6	98·0	80·9	111·4	Jan. 24
	Menzies ...	97·6	85·9	84·1	82·2	70·8	64·1	60·4	67·4	74·2	80·4	92·1	96·3	79·6	109·1	Dec. 25
	Kalgoorlie ...	95·7	84·7	83·6	80·7	70·5	62·7	60·0	65·2	72·2	79·7	90·8	93·6	78·3	108·9	Jan. 24
	Coolgardie ...	96·0	85·2	83·6	80·0	70·2	62·4	60·5	65·1	72·0	79·5	90·8	93·3	78·2	107·6	Jan. 23
	Southern Cross	97·8	88·2	86·4	81·1	69·1	62·3	61·9	65·1	71·8	80·9	91·3	94·2	79·2	113·0	Jan. 23

— Signifies "no record."

Digitized by Google

Mean Maximum Day Temperatures at the Chief Observing Stations in Western Australia during 1901—continued.

	Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.	Highest recorded	Date.
South-West and South.	Walebing ...	—	—	—	—	—	—	—	—	—	—	84·4	86·4	—	—	—
	Northam ...	—	—	—	—	—	—	—	—	—	—	85·3	87·1	—	—	—
	York	95·2	89·6	84·7	80·5	68·6	62·5	62·0	64·0	67·9	77·0	85·0	87·5	77·0	110·2	Nov. 27
	Guildford ..	88·8	88·8	86·0	80·8	69·5	64·4	64·0	65·5	68·1	74·8	80·3	82·5	76·2	108·0	Feb. 1
	Perth Gardens	88·6	87·8	83·9	78·0	68·4	63·4	63·1	64·7	67·7	73·7	80·6	82·6	75·2	106·7	Jan. 7
	Perth Observatory	84·2	84·6	81·5	77·3	67·7	62·9	62·7	63·4	65·2	70·4	75·5	77·6	72·7	104·7	Jan. 7
	Fremantle ...	80·8	81·2	78·7	75·6	67·2	63·9	62·9	62·6	64·3	78·0	72·1	73·8	70·9	104·0	Jan. 7
	Rottnest ...	77·1	78·0	75·7	73·8	67·1	62·9	61·9	63·0	64·9	67·7	72·4	73·2	69·8	101·4	Jan. 7
	Mandurah ...	84·8	85·3	81·4	77·2	68·0	63·2	60·1	63·8	65·2	70·9	75·9	78·5	72·8	107·0	Jan. 7
	Wandering ...	—	—	—	—	—	—	—	—	—	—	80·9	83·0	—	—	—
	Collie	86·3	85·4	80·1	74·3	64·7	60·5	60·7	61·0	63·6	71·8	76·6	79·5	72·0	103·0	Jan. 21
	Donnybrook ...	—	—	—	—	—	—	—	—	—	—	—	78·8	—	—	—
	Bunbury ...	83·0	85·3	79·4	76·2	67·9	64·3	63·2	64·1	64·4	70·3	73·9	76·2	72·4	103·0	Jan. 7
	Busselton ...	81·9	82·5	77·2	73·0	66·0	61·9	61·6	62·5	64·4	69·6	73·9	76·1	70·9	99·2	Jan. 7
	Bridgetown ...	85·5	85·0	79·3	73·8	65·9	60·8	60·4	61·1	63·7	72·0	76·0	79·0	71·9	102·5	Jan. 21
	Karridale ...	76·3	76·5	72·8	71·1	65·1	61·6	62·0	62·2	63·1	67·2	70·8	71·3	68·4	94·2	Mar. 6
	Cape Leeuwin	74·4	74·4	70·7	67·6	64·8	61·3	61·4	61·2	62·2	65·4	68·6	69·2	66·9	88·5	Mar. 6
	Katanning ...	89·5	84·9	79·2	73·8	64·4	58·6	58·7	59·6	64·3	62·5	81·1	83·2	72·5	106·0	Nov. 27 Jan. 22
	Albany ...	75·3	74·8	72·6	70·2	66·9	61·0	61·8	62·4	63·9	66·6	70·8	71·1	67·1	99·5	Jan. 8
	Breaksea ..	70·7	76·6	68·9	67·1	65·2	59·4	60·6	60·2	61·0	63·1	67·5	67·9	65·3	93·0	Mar. 6
	Esperance ...	79·1	78·9	77·4	73·9	70·1	63·1	62·5	65·0	67·7	70·8	76·2	78·8	72·0	107·6	Jan. 22
	Balladonia ...	—	—	—	—	—	63·7	61·5	65·3	71·2	76·3	87·2	89·9	—	—	—
	Eyre	78·5	76·1	77·9	73·8	71·2	65·7	61·6	64·8	69·0	70·9	78·2	79·5	72·3	111·2	Jan. 24

— Signifies "no record."

Digitized by Google

Mean Minimum Night Temperatures at the Chief Observing Stations in Western Australia during 1901.

	Station.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.	Lowest recorded	Date.
N.W. and N. Coast.	Wyndham ...	81·2	79·7	77·8	76·4	72·4	68·8	64·3	66·8	73·7	78·3	80·6	81·6	75·1	55·2	July 31
	Derby	77·9	78·4	76·6	70·8	63·8	62·0	58·5	54·5	66·1	68·7	75·7	79·6	69·4	45·2	Aug. 27
	Broome ...	79·9	77·9	76·0	69·8	61·9	61·2	58·9	52·8	64·4	68·4	76·5	79·6	68·9	43·0	Aug. 5
	Condon ...	78·0	—	—	62·1	55·6	52·3	50·8	46·8	56·1	59·3	71·9	74·0	—	38·0	July 31, Aug. 1
	Cossack ...	79·9	78·4	75·5	70·6	63·6	57·3	54·7	53·4	62·9	65·5	74·5	76·0	67·7	45·8	Aug. 3
	Onslow ...	73·7	75·9	73·7	69·5	62·8	56·4	50·1	50·0	57·5	62·4	67·9	68·5	64·0	40·0	Aug. 25
	Carnarvon ...	70·3	72·4	71·6	66·4	60·8	53·7	49·0	52·1	56·4	61·3	66·0	68·0	62·3	40·5	July 25, Aug. 24
	Hamelin Pool	67·2	70·6	69·5	62·3	58·4	51·4	49·7	49·0	51·7	57·5	60·5	63·2	59·2	38·2	July 31
	Geraldton ...	63·8	66·0	63·7	60·7	56·7	52·6	47·1	50·1	51·9	55·4	58·5	60·5	57·3	34·9	July 26
Inland.	Hall's Creek ...	76·3	76·2	69·5	61·7	—	52·0	49·1	47·9	59·9	65·2	75·2	78·6	—	32·8	Aug. 3
	Marble Bar ...	—	76·2	73·8	65·8	58·4	53·7	51·7	50·1	61·6	65·8	76·5	79·2	—	38·2	July 30
	Nullagine ...	76·2	74·7	69·6	58·3	51·6	47·6	46·5	43·8	56·4	60·1	72·8	72·6	60·8	31·9	July 31
	Bangemall ...	—	—	72·2	67·7	59·0	50·7	47·3	46·7	55·0	60·2	70·0	73·0	—	35·0	Aug. 25
	Peak Hill ...	77·3	70·8	68·1	64·4	54·5	46·8	42·9	46·2	53·9	59·9	70·5	74·2	60·8	34·0	July 5
	Wiluna ...		—	—	—	—	—	38·0	42·2	46·8	56·7	66·1	71·9	—	—	—
	Cue	73·9	70·2	65·6	62·8	53·6	45·5	42·8	44·8	48·9	56·4	64·0	68·0	58·0	33·2	July 25
	Yalgoo ...	67·3	69·0	65·3	60·7	51·9	45·5	41·1	44·5	47·0	54·8	60·2	63·0	55·9	33·0	July 4, Aug. 24
	Lawlers ...	72·8	67·7	63·9	61·3	52·3	44·5	40·6	46·0	49·2	57·6	66·5	71·9	57·9	32·0	July 3
	Laverton ...	69·5	66·1	61·2	57·3	49·6	41·2	38·8	44·2	48·0	53·3	66·0	69·3	55·4	29·0	July 26
	Menzies ...	68·0	64·7	60·6	57·0	50·8	44·5	40·8	44·5	47·7	55·1	64·1	67·5	55·9	34·5	July 26
	Kalgoorlie ...	64·6	62·8	59·1	56·7	51·1	44·8	41·1	45·6	48·6	53·4	61·5	64·2	54·5	32·6	July 27
	Coolgardie ...	62·8	61·2	57·5	55·2	49·6	43·0	39·4	44·3	46·7	52·2	60·2	62·1	52·9	33·0	July 3
	Southern Cross	65·0	61·4	56·9	54·2	47·3	41·8	37·3	42·1	44·0	50·6	56·8	61·2	51·6	27·1	July 4

— Signifies "no record."

Digitized by Google

Mean Minimum Night Temperatures at the Chief Observing Stations in Western Australia during 1901—continued.

	Station.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.	Lowest recorded	Date.
S.W. AND S.	Walebing ...	—	—	—	—	—	—	—	—	—	—	54·0	57·2	—	—	—
	Northam ...	—	—	—	—	—	—	—	—	—	—	54·0	57·5	—	—	—
	York	61·3	59·4	55·4	54·0	46·9	41·0	36·3	42·1	43·7	45·6	52·3	57·2	49·6	27·6	July 4
	Guildford ...	59·5	59·5	58·1	56·5	49·9	44·3	40·6	42·8	50·3	51·8	54·0	56·6	52·2	30·2	June 11 Aug. 24
	Perth Gardens	63·8	63·6	60·8	57·9	52·5	48·0	45·0	48·4	52·5	53·8	56·8	59·2	55·2	38·2	July 24 July 27
	Perth Observatory	63·2	62·9	60·6	58·2	52·5	48·5	45·5	48·2	51·9	53·6	56·1	58·5	55·0	38·7	July 24
	Fremantle ...	64·6	64·8	62·7	60·5	55·4	51·2	48·5	51·1	54·6	56·1	58·7	60·5	57·4	41·2	July 27
	Rottnest ...	65·1	64·6	63·4	62·3	57·8	53·5	52·3	53·0	55·0	56·9	59·3	60·7	58·7	45·0	July 27
	Mandurah ...	67·1	61·3	57·2	54·2	50·6	45·7	42·9	40·9	51·3	49·4	53·5	57·4	52·6	31·3	July 27
	Wandering ...	—	—	—	—	—	—	—	—	—	—	47·1	49·3	—	—	—
	Collie	54·5	52·2	48·9	45·2	41·0	37·2	32·8	38·0	45·2	44·1	48·1	50·3	44·8	26·9	July 30
	Donnybrook ...	—	—	—	—	—	—	—	—	—	—	—	50·5	—	—	—
	Bunbury ...	57·6	57·9	55·7	53·2	50·7	45·9	43·5	45·6	50·3	50·1	53·8	55·5	51·6	36·0	May 25 July 29
	Busselton ...	55·9	55·7	53·9	51·8	49·4	43·9	43·1	45·3	49·5	49·7	51·4	54·4	50·3	31·0	June 29
	Bridgetown ...	52·6	49·0	47·1	44·7	42·7	39·1	34·9	38·9	45·1	44·1	46·7	49·2	44·5	25·9	July 28
	Karridale ...	57·2	56·8	54·9	53·7	50·5	47·2	44·5	47·3	51·2	51·0	53·3	54·3	51·8	31·2	July 28
	Cape Leeuwin	62·8	63·0	60·6	60·0	56·4	53·0	51·8	53·2	54·2	55·8	58·4	59·3	57·4	43·5	July 28
	Katanning ...	56·4	55·0	52·0	49·7	45·9	41·1	36·4	41·2	45·4	45·4	49·8	52·9	47·6	25·0	July 4
	Albany ...	57·4	57·2	55·6	52·6	48·5	45·8	42·9	46·7	48·8	51·0	52·1	54·3	51·6	33·2	July 4
	Breaksea ...	60·0	61·3	59·0	56·8	55·0	49·7	48·8	50·5	51·4	53·3	55·9	57·6	54·9	34·5	Aug. 5
	Esperance ...	60·1	60·4	57·6	53·6	50·8	46·2	43·6	46·3	49·4	53·9	55·8	58·6	53·0	33·0	July 3
	Balladonia ...	—	—	—	—	—	40·4	37·0	41·5	45·4	47·6	54·1	57·1	—	—	—
	Eyre	58·4	62·1	57·1	52·2	50·9	43·9	40·8	43·2	48·9	50·7	55·6	59·0	51·9	28·2	July 4

— Signifies "no record."

Digitized by Google

Mean Maximum Day Temperatures at the Chief Observing Stations in Western Australia during 1900.

	Station	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.	Highest recorded	Month.
Coastal, North.	Wyndham ...	100·7	97·9	95·9	97·2	91·5	89·3	83·2	92·3	97·5	99·5	99·1	102·1	95·5	111·0	Jan. 16
	Derby	99·7	99·2	93·7	95·5	89·5	84·7	80·1	90·0	95·9	98·4	101·7	100·6	94·3	112·5	Nov. 6
	Broome ...	94·3	95·2	91·1	94·2	85·4	83·2	76·2	84·2	90·1	93·7	94·3	95·6	89·8	108·2	Oct. 29
	Condon ...	97·5	97·5	88·5	88·6	82·8	79·3	72·6	80·8	84·8	95·9	97·1	96·1	88·5	115·0	Dec. 28
	Cossack ...	102·5	100·8	91·8	86·4	81·0	78·8	70·9	79·7	84·5	97·3	97·2	101·4	89·4	112·7	Dec. 28
	Onslow ...	96·8	99·4	94·5	84·0	79·8	76·9	70·9	77·3	83·0	90·2	91·2	104·5	87·4	115·5	Feb. 15
	Carnarvon ...	91·6	89·0	87·6	78·5	77·1	71·4	68·8	70·8	76·0	79·7	81·6	84·3	79·7	113·0	Jan. 10
	Hamelin Pool	97·9	101·9	93·6	79·0	74·8	69·0	66·8	69·0	77·1	83·4	89·2	95·3	83·1	115·4	Feb. 12
	Geraldton ...	86·9	86·3	80·4	76·5	71·9	69·1	66·9	66·8	71·1	74·7	76·3	79·1	75·5	111·0	Jan. 8
Inland, North to South.	Hall's Creek ...	102·5	103·6	94·5	96·1	85·5	84·0	73·8	89·0	92·9	101·6	102·9	105·0	94·3	110·2	Dec. 26
	Nullagine ...	105·5	107·2	89·2	83·2	77·6	76·1	67·2	77·5	84·8	99·1	102·0	108·4	89·8	113·5	Feb. 11
	Peak Hill ...	99·4	104·1	90·2	73·6	67·4	64·8	60·3	66·7	75·1	90·0	95·7	101·0	82·4	111·8	Feb. 12
	Cue	97·4	103·7	88·9	73·1	67·8	63·2	61·0	64·7	73·3	86·3	95·0	99·3	81·1	113·8	Feb. 13
	Yalgoo ...	96·7	102·3	87·2	74·5	66·8	63·7	62·0	65·0	72·9	84·3	92·6	96·6	80·4	116·2	Feb. 13
	Lawlers ...	93·8	100·6	85·0	71·9	65·0	63·3	59·2	64·6	70·6	85·9	92·4	96·7	79·1	113·9	Feb. 13
	Menzies ..	90·9	97·5	83·2	68·1	63·0	61·8	58·2	63·5	68·1	83·5	89·5	93·1	76·7	112·8	Feb. 13
	Kalgoorlie ...	90·8	97·4	84·6	67·5	63·3	62·3	59·2	63·6	68·4	82·1	88·2	90·6	76·5	115·0	Feb. 13
	Coolgardie ...	89·0	96·1	82·2	67·1	63·0	62·4	58·9	63·0	67·7	81·6	87·9	90·7	75·8	114·3	Feb. 13
	Southern Cross	90·0	97·3	83·2	69·7	64·7	62·5	59·7	62·6	68·0	81·1	89·0	91·8	76·6	112·0	Feb. 13
	York	87·8	94·2	81·1	72·9	66·6	63·8	61·0	61·3	66·3	74·4	85·1	88·8	75·3	112·1	Feb. 8
	Katanning ...	82·7	88·5	76·8	68·4	64·5	60·1	58·0	57·8	62·4	69·5	78·8	83·5	70·9	107·0	Feb. 8
	Perth Observatory	82·2	87·4	77·3	73·6	68·6	64·7	62·7	61·5	66·0	71·6	77·2	80·0	72·7	106·0	Feb. 8
	Do. Gardens ...	84·8	90·8	80·2	75·3	69·2	65·3	62·7	62·7	68·2	74·4	80·8	83·6	74·8	107·0	Feb. 21
Coastal, South.	Fremantle ...	80·4	83·3	75·2	72·5	68·8	65·3	62·8	61·3	65·3	70·1	74·1	75·5	71·2	101·5	Feb. 8
	Rottnest ...	77·1	77·5	73·1	71·4	67·3	64·9	62·2	61·4	63·9	69·3	71·9	73·8	69·6	102·6	Feb. 21
	Bunbury ...	81·0	85·4	75·4	74·2	69·3	65·3	62·6	61·9	64·9	70·3	77·1	79·9	72·3	100·0	Feb. 21
	Karridale ...	73·8	75·2	71·1	69·1	66·4	63·0	60·8	59·6	62·7	67·1	70·3	73·6	67·7	94·0	Feb. 8
	Cape Leeuwin	71·3	72·7	69·7	68·1	65·5	63·2	61·1	59·4	62·3	64·8	68·4	71·9	66·4	85·0	Dec. 5
	Albany ...	71·2	74·9	69·2	66·4	64·0	61·2	60·3	58·6	62·6	65·5	69·0	72·3	66·3	93·6	Dec. 5
	Breaksea Island	69·2	70·6	66·8	64·8	63·4	60·5	59·3	57·3	60·6	61·9	66·4	69·2	64·2	90·5	Dec. 5
	Esperance ...	75·3	79·1	73·8	68·2	66·5	64·0	61·6	61·4	63·9	70·1	74·6	75·6	69·6	103·4	Feb. 2

Digitized by Google

		ary							ber.	ber.	ber.	ber.	ear.	recorded	Month.
Coastal, North.	Wyndham ...	82·5	80·9	80·3	80·0	73·9	67·2	66·6	73·5	76·5	80·2	82·2	83·1	77·2	57·0	July 3
	Derby	80·2	78·6	76·2	74·8	69·3	61·0	58·8	60·7	64·9	72·6	79·0	81·1	71·4	47·5	July 28
	Broome ...	81·2	79·7	75·9	74·8	67·6	60·6	57·6	58·6	64·7	69·8	77·7	81·2	70·8	50·0	July 29
	Condon ...	75·6	78·3	74·4	71·1	60·2	55·4	47·5	49·0	54·2	63·9	69·7	76·3	64·6	39·0	July 7, Aug. 10
	Cossack ...	78·0	81·0	77·3	72·5	63·7	61·0	53·1	54·4	59·7	68·3	70·9	77·4	68·1	46·2	Aug. 10
	Onslow ...	72·6	77·8	75·7	69·7	60·5	57·5	50·3	49·9	54·0	60·1	63·1	70·6	63·5	40·0	Aug. 10
	Carnarvon ...	71·2	73·8	69·7	64·0	56·7	55·9	48·6	50·3	54·1	61·6	65·1	69·1	61·7	41·0	Aug. 9
	Hamelin Pool	66·5	71·9	67·6	61·7	55·2	54·9	46·4	46·0	50·7	56·6	59·6	64·0	58·4	37·0	July 6
	Geraldton ...	64·3	66·4	60·2	60·4	53·6	56·6	49·4	52·6	49·7	57·0	59·6	63·0	57 7	39·0	Sept. 18
Inland, North to South.	Hall's Creek ...	75·9	75·9	74·3	66·4	62·1	52·3	52·0	55·7	61·6	68·5	76·1	78·1	66·6	38·0	July 23
	Nullagine ...	75·9	78·3	71·3	67·3	55·2	52·3	44·9	46·4	52·4	66·3	70·0	77·7	63·2	32·5	July 6
	Peak Hill ...	72·7	79·2	68·3	60·0	50·5	50·4	43·3	44·9	49·0	62·7	67·5	75·4	60·3	36·2	July 6
	Cue	69·1	76·6	65·0	58·6	48·9	49·7	43·1	43·3	46·7	57·7	64·3	69·4	57·7	34·2	Aug. 8
	Yalgoo ...	66·5	73·6	62·2	58·7	48·0	48·2	41·6	42·2	43·6	53·3	59·5	64·8	55·2	31·8	Aug. 8
	Lawlers ...	68·6	74·1	63·5	56·6	47·2	57·4	40·5	40·5	44·4	59·1	65·0	69·5	56·4	28·2	Aug. 8
	Menzies ...	63·5	70·1	59·9	54·5	46·1	46·9	41·5	40·8	43·7	57·2	61·9	66·1	54·4	29·7	Aug. 8
	Kalgoorlie ..	60·7	66·9	57·8	53·5	46·6	47·7	41·5	42·2	43·9	55·7	60·0	62·5	53·3	35·9	July 4
	Coolgardie ...	60·2	65·8	57·1	54·0	46·0	46·6	40·7	41·7	43·1	53·9	58·5	60·6	52·4	31·2	Aug. 8
	Southern Cross	58·8	64·6	53·7	53·0	44·5	45·6	38·8	40·6	41·7	51·1	57·5	61·2	51·0	25·0	Aug. 8
	York	58·0	60·9	50·5	52·3	43·8	46·2	39·1	42·7	38·9	48·7	53·5	58·1	49·4	31·0	July 3
	Katanning ...	53·2	55·9	46·1	49·8	44·3	45·3	40·8	43·5	41·0	48·6	52·0	53·1	47·8	31·0	July 20
Perth Observatory		62·2	64·9	56·3	56·7	50·6	51·6	47·5	49·4	48·4	55·7	58·4	61·0	55·2	39·0	Sept. 18
Do. Gardens ...		61·9	64·5	55·9	56·6	49·6	52·1	46·4	49·8	48·0	56·2	58·7	61·2	55·1	38·8	Aug. 7
Coastal, South.	Fremantle ...	63·3	65·8	57·8	58·1	53·4	55·3	50·4	52·0	50·2	57·4	59·2	61·9	57·1	41·0	Aug. 7
	Rottnest ...	62·2	66·2	59·9	59·3	56·1	55·1	52·3	52·4	52·3	58·1	60·3	61·8	58·0	42·4	June 18
	Bunbury ...	57·6	60·2	51·6	53·1	49·2	51·6	47·2	48·2	47·0	53·4	54·5	56·3	52·5	36·2	Aug. 7
	Karridale ...	56·8	57·7	50·5	51·7	47·2	51·3	46·4	49·2	45·7	52·5	52·7	55·7	51·5	31·0	July 14
	Cape Leeuwin	61·1	62·4	58·2	58·7	55·8	54·7	52·2	52·0	52·0	56·4	58·2	60·8	56·9	44·7	Aug. 31
	Albany ...	56·8	58·1	51·3	53·1	47·9	46·2	44·2	45·4	45·8	50·9	52·8	55·1	50·6	35·0	Sept. 8
	Breaksea Island	58·2	60·6	55·8	56·4	53·9	51·1	49·1	48·4	48·5	53·3	55·5	57·8	54·0	40·0	Sept. 17
	Esperance ...	57·1	59·9	54·1	55·0	48·7	48·4	43·0	46·1	47·0	51·6	55·6	56·5	51·9	35·0	May 20, July 21

Digitized by Google

Average Temperature and Rainfall at Perth (from Records made in the Botanic Gardens from 1876 to 1901).

Month.	Temperature.								Rainfall.		
	Mean Maximum.	Mean Minimum.	Mean of Month.	Highest ever Recorded.	Lowest ever Recorded.	No. of hot days, or days when the Maximum exceeded 90°			Mean Monthly Amount.	Greatest in one Month.	Least in one Month.
						Mean.	Greatest.	Least.			
January ...	87·9	62·6	75·2	116·7	46·0	12	24	4	·36	2·17	*Nil*
February ...	88·7	63·0	75·8	113·8	49·0	12	19	7	·39	2·30	*Nil*
March ...	84·5	60·7	72·6	106·2	46·0	9	18	2	·84	4·50	*Nil*
April	77·6	54·9	66·2	106·5	41·0	2	7	0	1·76	4·97	·05
May	70·1	50·5	60·3	92·0	34·0	0	1	0	4·89	12·13	1·56
June	64·7	47·3	56·0	81·0	31·2	0	0	0	6·68	12·11	2·16
July	63·9	46·0	55·0	75·2	33·0	0	0	0	5·95	10·26	3·02
August ...	65·4	47·2	56·3	83·5	33·6	0	0	0	5·79	10·33	1·08
September ...	68·7	49·4	59·0	89·0	35·0	0	0	0	2·93	6·01	·69
October ...	72·8	52·4	62·6	97·0	38·0	1	2	0	2·06	7·87	·49
November ...	79·4	57·1	68·2	105·0	41·0	3	8	0	·83	2·12	*Nil*
December ...	83·4	60·4	71·9	114·0	47·0	8	11	3	·66	3·05	*Nil*
Year ...	75·6	54·3	64·9	116·7	31·2	—	—	—	33·14	12·13	*Nil*

Digitized by Google

Monthly Rainfall at Perth (from Records made in the Botanic Gardens from 1876 to 1901).

Year.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
	Rainfall	Days.	Rainfall.	Days.	Rainfall	Days.	Rainfall.	Days	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days.	Rainfall.	Days.
Rainfall (100—1 inch)																										
1876	61	6	4	1	192	4	38	3	263	10	845	19	242	9	382	12	320	8	259	13	171	11	96	4	2873	100
1877	18	3	3	3	...	...	105	7	554	22	216	10	667	18	328	20	69	4	54	11	13	2	21	3	2048	103
1878	16	3	79	5	93	7	278	12	606	14	558	16	943	20	701	22	429	21	102	14	151	7	16	2	3972	143
1879	217	2	15	1	51	4	202	2	1213	14	656	15	556	13	535	16	213	12	350	13	62	9	64	5	4134	106
1880	28	5	72	4	114	6	332	12	334	13	717	16	375	10	628	17	254	14	104	9	212	7	9	3	3179	116
1881	113	4	2	1	112	4	113	5	431	15	535	13	550	15	108	11	268	13	52	5	130	7	64	8	2478	101
1882	15	4	3	1	90	6	407	15	273	13	494	11	852	18	1033	22	106	9	86	5	109	3	10	2	3568	109
1883	10	2	230	8	64	3	269	6	477	15	1181	23	512	18	554	14	207	10	196	8	118	6	147	9	3965	122
1884	51	1	25	2	...	...	104	6	283	7	857	19	365	9	822	17	236	14	293	9	75	4	85	4	3196	92
1885	41	2	...	...	88	2	294	8	869	18	506	17	529	18	559	25	138	7	156	6	84	4	80	3	3344	110
1886	12	2	62	1	...	...	69	3	277	7	422	10	621	17	706	21	551	18	71	5	99	5	...	...	2890	89
1887	19	3	95	2	119	5	234	7	362	7	582	13	1026	20	684	15	357	16	151	8	89	6	34	3	3752	105
1888	...	...	1	1	68	3	172	10	402	15	487	18	323	17	569	14	208	11	111	12	137	10	305	6	2783	117
1889	82	3	42	2	67	4	399	8	827	15	983	20	302	16	364	16	313	14	472	14	124	8	21	3	3996	123
1890	2	2	56	3	2	1	5	1	796	17	1211	19	391	14	593	21	601	20	787	21	44	2	185	5	4673	126
1891	4	1	...	...	86	6	19	4	732	15	628	17	712	12	313	14	458	14	66	7	...	...	15	3	3033	93
1892	12	5	19	1	41	8	131	7	478	12	528	14	565	19	975	25	220	14	49	5	97	7	8	5	3123	122
1893	4	2	67	6	171	8	363	13	768	19	322	9	882	21	439	17	530	19	303	18	59	8	104	5	4012	145
1894	...	...	38	2	33	7	5	2	333	8	435	21	495	13	385	16	332	15	148	11	21	3	147	5	2372	103
1895	21	1	108	7	8	3	151	8	156	9	844	14	683	19	654	24	468	20	108	9	13	2	87	7	3301	123
1896	10	2	...	...	450	8	94	6	363	14	722	17	852	14	371	14	108	10	98	10	23	3	59	5	3150	103
1897	...	...	29	4	143	2	118	6	312	13	570	18	419	14	543	16	322	13	109	6	116	7	14	2	2725	101
1898	49	1	36	2	14	2	46	3	349	9	619	15	567	16	870	16	213	17	354	21	76	6	11	1	3204	109
1899	17	1	37	4	12	4	332	12	225	9	621	17	710	13	560	14	180	9	432	15	58	4	12	2	3196	104
1900	117	5	3	1	24	2	130	5	291	7	1121	23	536	16	786	26	252	11	271	15	38	3	56	2	3625	116
1901	11	2	1	1	149	7	48	5	751	16	704	19	801	12	590	17	263	15	164	12	44	5	58	7	3584	118
Mean for 26 years	36	2	39	2	84	4	176	7	489	13	666	16	595	16	579	18	293	13	206	11	83	5	66	4	3314	111

Digitized by Google

Rainfall in Western Australia during 1900-1901.

With averages (to the end of 1901) for all Stations having at least five years' record. 100 Points = 1 inch. The Sign ... signifies "no rain fell." The Sign — signifies "no record."

NOTE.—The stations are grouped into divisions, and these are subdivided into square degrees, which are figured according to the latitude and longitude of the N.W. corner of each square, the first two figures representing the latitude and the last two the longitude, less 100°. Thus Perth is in the square 3115, showing that its latitude is 31° odd minutes, and its longitude 115° odd minutes. The mean rainfall for each square degree is adopted from all the stations situated in that square having complete records for the year. The average is taken for all years up to and including 1901.

Square.	Locality.	Total for 1900. Rainfall.	Total for 1900. Wet Days.	Mean for Square Degree during 1900.	Mean for Square Degree during 1901.	Average to 31st December, 1901, for Square Degree.	No. of Years for Average.
	EAST KIMBERLEY DIVISION.						
1528	Wyndham	1758	62	1758	1877	2684	15
1628	Rosewood Downs ...	1641	38				
	Argyle Downs ...	2064	48				
	Lisadell	1429	29	1711	2480	2453	10
1728	Ord River ...	1340	55				
	Turkey Creek ...	1449	56	1394	2317	2147	7
1827	Hall's Creek ...	1819	51				
	Ruby Creek ...	542	—	1180	2304	2026	11
1828	Flora Valley ...	1013	43	1013	1937	—	—
1928	Denison Downs ...	1266	36	1266	2146	—	—
	WEST KIMBERLEY DIVISION.						
1623	Obagama	2359	50	2359	2083	3369	6
1722	Broome	1844	49	1844	3405	2459	12
1723	Derby	1690	40				
	Yeeda	1768	41	1729	1852	2560	16
1724	Balmaningarra ...	—	—	—	—	2190	5
1725	Leopold Downs ...	1375	39	1375	2089	—	—
1821	La Grange Bay ...	1532	42	1532	2532	2020	11
1822	Thangoo	...	...	...	1604	2438	8
1823	Mt. Anderson ...	1707	62	1707	1736	—	—
1824	Upper Liveringa ...	1971	41	1971	1734	—	—
1825	Fitzroy Crossing ...	1709	52				
	Quanbun Downs ...	1456	38				
	Noonkambah ...	1767	47	1644	2291	2321	8
	NORTH-WEST DIVISION.						
1920	Wallal	1503	30	1503	2158	1904	5
2017	Cossack	4003	34				
	Roebourne	4173	32				
	Whim Creek ...	3585	44				
	Balla Balla ...	2525	36	3572	1128	1317	20
2018	Boodarrie	1637	24				
	Port Hedland ...	1431	25	1534	1709	1380	14
2019	Condon	1905	29				
	De Grey River ...	1208	25				
	Mulgie	1290	23	1468	1992	1435	14

Digitized by Google

Rainfall in Western Australia during 1900-1901—continued.

Square.	Locality.	Total for 1900. Rainfall.	Total for 1900. Wet Days.	Mean for Square Degree during 1900.	Mean for Square Degree during 1901.	Average to 31st December, 1901, for Square Degree.	No. of Years for Average.
	North-West Division—*continued.*						
2120	Bamboo Creek ...	1752	32				
	Coongon	1142	17				
	Eel Creek	1401	31				
	Muccan	1144	37				
	Warrawagine ...	893	29				
	Warralong ...	1464	25	1300	1767	1580	7
2114	Onslow	2696	40	2696	259	820	16
2115	Mardie	2239	36				
	Peedamullah ...	2241	37				
	Chinginarra ...	2867	34				
	Yarraloola ...	1979	29	2332	558	835	15
2116	Fortescue	2162	40	2162	268	1099	14
2117	Mt. Florence ...	2623	31				
	Woodbrook ...	2521	18				
	Tambray	3307	42				
	Millstream	3538	25				
	Cooyapooya ..	2987	36	2995	1226	1578	15
2119	Marble Bar ...	1753	36				
	Corunna Downs ...	1850	33				
	Tambourah ...	2674	37				
	Warrawoona ...	2280	36	2139	1918	1589	7
2120	Nullagine	1576	37	1576	2041	—	—
2213	Point Cloates ...	2357	52	2357	868	—	—
2214	Yanrie	1817	33	1817	793	862	5
2215	Wogoola	1735	37				
	Nanutarra	1846	42	1790	765	994	8
2216	Red Hill	2482	41				
	Mt. Stewart ...	1882	36	2182	997	1030	12
2218	Mulga Downs ...	1885	29	1885	979	—	—
2219	Roy Hill	—	—	—	1450	—	—
	Kerdiadary ...	—	—	—	—	—	—
	Gascoyne Division.						
214	Williambury ...	1701	37				
	Winning Pool ...	1743	42				
	Wandagee	1718	27	1721	763	870	13
215	Towera	1514	41				
	Woorkadjia ...	1181	37				
	Yanyeareddy ...	1974	36	1556	800	1018	9
216	Ullawarra	1573	33	1573	728	900	5
413	Carnarvon	1475	50				
	Boolathana ...	1771	42	1623	602	847	19
414	Cooralya	1556	34				
	Doorawarrah ...	1445	35	1500	392	852	14
513	Shark Bay ...	1100	46				
	Dirk Hartogs Island	1632	75	1366	760	927	9
514	Wooramel	1335	42	1335	336	—	—
515	Clifton Downs ...	1552	52				
	Meedo	1335	56	1444	429	605	10
516	Errivilla	1437	43	1437	384	646	9
517	Mt. Gould	1964	35				
	Berringarra ...	1579	30	1772	280	727	15

Digitized by Google

Rainfall in Western Australia during 1900-1901—continued.

Square.	Locality.	Total for 1900. Rainfall.	Total for 1900. Wet Days.	Mean for Square Degree during 1900.	Mean for Square Degree during 1901.	Average to 31st December, 1901, for Square Degree.	No. of Years for Average.
	GASCOYNE DIVISION—*continued.*						
2518	Peak Hill	2499	61	2499	774	—	—
2613	Kararang	1672	65	1672	1020	945	8
2614	Hamelin Pool ...	840	55	840	461	741	16
2615	Byro	1592	48				
	Woogorong... ...	1001	31	1296	261	—	—
2616	Manfred	1379	44				
	Milly Milly ...	1343	30	1361	202	646	12
2617	Mileura	1385	30	1385	351	—	—
2618	Nannine	1265	30				
	Annean	1489	41				
	Abbotts	1831	57				
	Belele	1522	26				
	Star of the East ...	1274	30	1476	534	702	12
2715	Wooleane	1537	45	1537	350	735	7
2716	Murgoo	1435	46	1435	412	721	13
2717	Cue	1975	52				
	Coodardy ...	1567	39				
	Day Dawn	1640	41				
	Lake Austin ...	1361	48	1636	533	657	7
2816	Yalgoo	1294	53				
	Gullewa	1503	85				
	Gabyon	1207	—	1335	572	964	13
2817	Mt. Magnet ...	1372	54				
	Youragabbie ...	1254	36	1313	412	632	7
2818	Challa	1036	34	1036	452	660	6
	SOUTH-WEST DIVISION.						
2714	Murchison House ...	1980	85				
	Mt. View	1982	89	1981	1304	—	—
2813	Abrolhos	—	—	—	—	1344	5
2814	Northampton ...	2688	69				
	Geraldton	2102	97				
	Greenough	2610	80				
	Oakabella	2692	57				
	Bootenal	1996	68				
	Mt. Erin	2592	84				
	Narra Tarra ...	2256	50				
	Tibradden	2551	71	2436	1848	1896	25
2815	Mullewa	1359	45				
	Yuin	1422	58	1391	1092	990	6
2914	Dongara (Pearse) ..	2000	82				
	Dongara (P.O.) ...	2050	93	2025	1860	1855	18
2915	Minginew	2284	89				
	Carnamah	1956	91	2120	1625	1489	14
2916	Rothesay	1593	81	1593	1049	—	—
3015	Yatheroo	3150	106				
	Dandarragan ...	2847	104	2998	2271	2416	17
3016	New Norcia ...	2695	109				
	Walebing	2195	102				
	Moora	1843	92				
	Watheroo	1811	77	2136	1525	1842	19

Digitized by Google

Rainfall in Western Australia during 1900-1901—continued.

Square.	Locality.	Total for 1900. Rainfall.	Total for 1900. Wet Days.	Mean for Square Degree during 1900.	Mean for Square Degree during 1901.	Average to 31st December, 1901, for Square Degree.	No. of Years for Average.
	South-West Division—*continued*.						
3115	Gingin	4293	101				
	Rottnest	2576	120				
	Perth Gardens ...	3625	116				
	Perth Observatory	3661	124				
	Subiaco	3519	119				
	Claremont (Richardson)	3311	102				
	Claremont	3685	119				
	Kalbyamba... ...	3832	121	3563	3341	3108	26
3116	Culham	2499	98				
	Newcastle	2798	90				
	Northam	1770	88				
	Grass Valley ...	1802	77				
	Guildford	3752	107				
	Belvoir	3309	97				
	Cobham	2131	106				
	Canning Timber Mills	5058	111				
	Eumalga	2606	100				
	York	2110	98				
	Mundaring Weir ...	4493	116	2939	1875	2106	25
3117	Doongin	1574	66				
	Meckering	1875	89				
	Sunset Hills ...	1642	78				
	Whitehaven ...	1671	71				
	Kellerberrin ...	1581	79	1669	1137	1232	13
3215	Mandurah	4188	114				
	Jarrahdale	5005	110				
	Pinjarra	4555	99				
	Fremantle	2741	121				
	Harvey	4465	119				
	Rockingham ...	3377	102	4055	3278	3394	25
3216	Beverley	1776	79				
	Wandering ...	3214	105				
	Bannister	3160	91				
	Canning Water Works	4091	107				
	Marradong ...	3162	99	3080	2497	2187	19
3217	Barrington ...	1695	82				
	Sunning Hill ...	1932	69				
	Pingelly	1804	85				
	Narrogin	1823	98				
	Wickepin	2133	96	1877	1262	1689	14
3315	Bunbury	4071	129				
	Boyanup	4041	128				
	Quindalup	3900	96				
	Busselton	3780	149				
	Margaret River ...	5214	127				
	Lower Blackwood...	4723	115	4288	3565	3408	25

Digitized by Google

Rainfall in Western Australia during 1900-1901—continued.

Square.	Locality.	Total for 1900. Rainfall.	Total for 1900. Wet Days.	Mean for Square Degree during 1900.	Mean for Square Degree during 1901.	Average to 31st December, 1901, for Square Degree.	No. of Years for Average.
	South-West Division—*continued.*						
3316	Williams	2489	85				
	Darkan	2451	82				
	Greenbushes ...	4855	—				
	Bridgetown ...	4434	150				
	Mandalup	4365	103	3719	2764	2868	17
3317	Arthur	2131	96				
	Wagin	1788	110				
	Glen Cove	2090	83				
	Dyliabing	1691	75				
	Katanning	2133	107				
	Kojonup	2223	97				
	Broomehill	1936	86				
	Sunnyside	1874	115				
	Woodyarrup ...	1874	106	1971	1465	1824	17
3318	Glen Vale		—	—	—	1602	5
3319	Jarramongup ...	1582	87	1582	1377	1409	7
3415	Karridale	5181	190				
	Cape Leeuwin ...	4184	213	4682	4137	3897	19
3416	Ballarup	4064	147				
	Riverside	3495	166				
	Lake Muir	3602					
	The Warren ...	5902	152	4266	3032	3983	7
3417	Cranbrook	1901	108				
	Forest Hill	3380	185				
	Mt. Barker	2699	143				
	St. Werburghs ..	2559	161				
	Albany ...	3729	179				
	Point King ..	3647	154				
	Denmark .	5252	158	3310	2550	3040	25
3418	Pallinup .	1802	85				
	Cape Riche	2196	97				
	Breaksea	2773	185	2257	1730	2281	12
3419	Bremer Bay	2169	105	2169	2038	2223	17
	Eastern Division.						
2620	Lake Way	2843	51	2843	765	—	—
2721	Lake Darlot	1770	33	1770	767	—	—
2820	Lawlers	1523	66	1523	748	779	5
2821	Dorrie King	1198	61				
	Sturt Meadows	1233	59				
	Mt. Leonora	1290	55				
	Mt. Malcolm	1215	52				
	Marren Murrin	1157	57	1223	590	—	—
2822	Laverton	1555	50				
	Mt. Morgans	1084	56	1317	715	—	—
2917	Fred's Pool	1543	47	1543	540	—	—
2921	Menzies	1277	58				
	Niagara	1129	48				
	Donnybrook	1015	-	1129	801	684	5
2922	Siberia	1015		1015		—	—
3018	Wattenburg			—	527	903	5
3019	Mt. Jackson	1295	55	1295	675		—

Rainfall in Western Australia during 1900-1901—continued.

Square.	Locality.	Total for 1900. Rainfall.	Total for 1900. Wet Days.	Mean for Square Degree during 1900.	Mean for Square Degree during 1901.	Average to 31st December, 1901, for Square Degree.	No. of Years for Average.
	Eastern Division—*continued.*						
3021	Goongarrie	943	45				
	Kanowna	1022	71				
	Kalgoorlie	1171	69				
	Coolgardie	1197	76				
	Bulong	996	69				
	Kurawa	1001	59	1055	760	714	9
3022	Kurnalpi	1128	63	1128	763	768	5
3118	Mangowine ...	1299	67				
	Bodallin	1349	67				
	Burracoppin ...	1256	—	1301	880	1090	15
3119	Southern Cross ...	1129	62				
	Karalee	1416	56				
	Yellowdine... ...	974	—	1173	679	889	12
3120	Boorabbin	1337	67				
	Woolgangie ...	1203	—				
	Bulla Bulling ...	1098	46	1213	753	790	7
3121	Widgemooltha ...	1294	64				
	Londonderry ...	1284	84				
	50-Mile Tank ...	1348	69	1309	733	—	—
3221	Norseman	1253	67	1253	872	892	6
3222	Frazer's Range ...	—	—	—	724	—	—
	Eucla Division.						
3320	Cocanarup	1474	102	1474	1625	—	—
3321	Grass Patch ...	1912	115				
	Swan Lagoon ...	2003	136				
	30-Mile Condenser	2080	58				
	Gibson's Soak ...	2409	90				
	Esperance	2930	139				
	Park Farm... ...	2667	111				
	Fanny's Cove ...	2799	110	2400	1800	2308	18
3322	Lynburn	—	—	—	1601	—	—
3323	Israelite Bay ...	1498	81	1498	1315	1424	7
3223	Balladonia	1515	63	1515	759	940	11
3226	Eyre...	1667	97	1667	1188	1055	17
3128	Eucla	1705	89	1705	1202	1042	18

Digitized by Google

5.—PRINCIPAL TOWNS AND OTHER CENTRES OF POPULATION IN WESTERN AUSTRALIA.

[These short descriptions are, as a rule, supplied by the Mayors of Municipalities, and Stipendiary Magistrates within whose Districts the Towns are situated, these officials being, presumably, the most fitting persons to furnish authentic information. The populations given relate, in most cases, to the census districts.]

CAPITAL.—PERTH, the capital of the State (latitude 31° 57′ 10″ South and longitude 115° 50′ 26″ East), is pleasantly and picturesquely situated on the banks of the Swan River, about 12 miles in a North-Easterly direction from the port of Fremantle, which is in latitude 32° 3′ and longitude 115° 45′. The first stone of the city was publicly laid on the 12th August, 1829, the anniversary of the birth of the then reigning monarch, King George the Fourth.

According to the census taken in March, 1901, there were within the municipal boundaries 5,004 occupied and 104 unoccupied habitations, whilst 18 were in course of erection.

The Swan River Mechanics' Institute possesses a fine building on Hay Street, containing reading-rooms, library, lodge-room, and a large concert hall. Among other buildings more or less recently erected, the Wesley Block on William Street, including one of the largest halls in the city, the Convent and School at Highgate Hill, the Church of England Orphanage, the Baptist Church, the Fire Brigade Station, two new Police Stations, and the Victoria Library add to the general appearance of the metropolis.

The population of Perth municipality, as disclosed by the 1901 census, was 27,553, consisting of 14,591 males and 12,962 females. The population of Perth city and suburbs was found to be as follows:—

	Males.	Females.	Total.
Perth Municipality ...	14,591	12,962	27,553
Leederville	1,331	1,215	2,546
Subiaco	1,514	1,490	3,004
Victoria Park	674	593	1,267
South Perth	398	398	796
North Perth, etc. ...	603	505	1,108
Total	19,111	17,163	36,274

The following vital statistics concerning the city and suburbs of Perth during 1900 and 1901 are of interest:—

	1900.			1901.		
	Males.	Females.	Total.	Males.	Females.	Total.
Births ...	621	619	1,240 ...	671	633	1,304
Deaths ...	324	197	521 ...	377	245	622

The area of the municipality of Perth is about 2,545 acres, while the adjacent Park* Reserve contains 1,030 acres. The total area of the city and suburbs is 20,857 acres.

* For particulars of "King's Park," see Part IV. ("Public Works and Institutions.")

Digitized by Google

The city is now traversed in several directions by lines of electric tramway, extending through Leederville and Subiaco.

The rapidly growing municipality of *Leederville* borders on the North-Western extremity of the city, and further to the West lies the equally thriving municipality of *Subiaco*.

Connected with the city of Perth by the Causeway Bridge, and more directly by a steam ferry service, is *South Perth*, situated on the left bank of the river. Higher up on the same side lie the municipality of *Victoria Park* and the hamlets *Burswood* and *Belmont*.

About six miles from Perth, prettily situated on the North bank of the Swan, is the municipality of *Claremont*, with *Cottesloe* and *Peppermint Grove* in close proximity.

About half-way between Perth and Guildford is the growing hamlet of *Bayswater*, the centre of a large area of excellent gardening land. A new railway station has been built, and at *Falkirk* siding, a mile distant, a large foundry, especially established for the manufacture of the "seamless" pipes, which are being used in the Coolgardie Water Scheme, has been started. In this neighbourhood, picturesquely situated on the left bank of the Swan River, is the racecourse of the Western Australian Turf Club—the leading racing club in the State.

Places of Public Interest.

Zoological Gardens, at South Perth, open on week days from 10 a.m. to 5·30 p.m., and on Sundays from 2 p.m. to 5·30 p.m.

Public Library, corner of James and Beaufort Streets, open on week days between 10 a.m. and 10 p.m., and on Sundays between 2 p.m. and 5 p.m.

Museum and Art Gallery, Beaufort Street, open on week days between 10 a.m. and 5 p.m. (Fridays excepted), and on Sundays between 2·30 p.m. and 5 p.m.

Museum, Department of Agriculture, West Australian Chambers. Open daily.

King's Park, open from sunrise to 10 p.m.

King's Park Terrace, Mount's Bay Road.

Perth Public Gardens, opposite General Post Office, open on week days from 9 a.m. to sunset, and on Sundays from 2 p.m. to 6 p.m.

Association Ground, East Perth, open to the public free, except when games or sports are in progress.

East Perth Park, or Queen's Gardens, open from 9 a.m. to 6 p.m.

Esplanade Recreation Reserve, open at all times.

Wellington Reserve, between Wellington and Wittenoom Streets.

Digitized by Google

Mill Point Reserve, South Perth, always open.

Point Walter Picnic Reserve, on the Swan River.

Karrakatta Rifle Range, available by train from Perth.

Perth Bowling Green (Esplanade reserve), always open for inspection.

Legislative Assembly Chamber, Hay Street, open to inspection by permission.

Legislative Council Chamber, St. George's Terrace, open to inspection by permission.

Perth Mint, Hay Street.

Perth Observatory, Hay Street West, open to inspection by application to the Government Astronomer.

Public Offices, St. George's Terrace and Barrack Street.

Post Office, St. George's Terrace. Main hall open from 7 a.m. to 10 p.m.

Town Hall, Hay Street.

Government House and Grounds. Permission from His Excellency the Governor must be obtained to inspect.

Museum, Geological Survey Department, St. George's Terrace, open Monday to Friday from 9 a.m. to 1 p.m., and from 2 p.m. to 4·30 p.m.; and on Saturdays from 9 a.m. to 1 p.m.

Perth Hospital, Murray Street, open to visitors to patients on Wednesdays and Sundays, between 2 p.m. and 4 p.m.

Perth Racecourse, off Guildford Road, about four miles from the city, available by rail, road, and river.

Canning Park Course, Cannington, available by road and train.

Helena Vale Course, Midland Junction, available by road and train.

Albany (King George Sound), one of the principal seaport towns of the State, is situated on Princess Royal Harbour. Population: Males, 1,782; females, 1,812; total, 3,594. Port of call for H.M. ships when first joining the Australian Naval Station, as it is a coaling port, about 5,000 tons of coal being afloat in hulks. The channel between the Sound and Princess Royal Harbour is at present 27 feet deep at low water, as is the anchorage of about 160 acres, with excellent holding ground in the shape of a hole for receiving anchors 300 feet by 600 feet, 34 feet deep, and lying about 630 feet off the Deep Water jetty. The channel and anchorage are being enlarged and deepened to 30 feet at low water, the work being now nearly completed.

The King George Sound, or outer harbour, also has excellent holding ground for an unlimited number of ships, with perfect shelter from North-West and South-West, the stormy quarter.

Digitized by Google

Albany is the terminus of the Great Southern railway, connecting it with the Eastern system at Beverley, distant 240 miles. The railway jetty extends into the harbour, with 30 feet of water at low tide. The town jetty also berths steamers, with a depth at low water of 21 feet. Since 1892 Albany has been a fortified station for Australian defence, the expenditure being shared by the Eastern States. The forts are garrisoned by a company of permanent artillery, commanded by an Imperial officer belonging to the Royal Artillery. A steamer subsidised by Government runs weekly between Albany and South Coast townships, including Esperance and Mary Ann Harbour, the port of the newly-discovered Phillips River goldfield. The climate is beautifully cool, with an excellent rainfall. Near Albany there are several picturesque camping-grounds, such as Middleton Beach; also beautiful views of the outer and inner harbours are obtainable from the recently-constructed military road, one of the most picturesque drives in the States. These attractions, combined with its lovely climate, make the town a favourite resort for visitors during the heat of the summer months.

Austin is on an island in Lake Austin, situated about 16 miles South of Cue. A large quantity of alluvial gold has been found in the neighbourhood, some of the leads having been worked to a considerable depth, and reefing is also carried on with good results There is a post office. The Cue railway passes through Austin. Good water is obtainable by sinking. Population, 140.

Four miles North-East of Austin is a mining camp, named *Mainland*, where some reefs are being worked. Population, 25.

Balingup is a townsite 17 miles from Bridgetown, on the Balingup Brook, an affluent of the Blackwood River. The land in the vicinity is good. There is a station on the Bunbury-Bridgetown railway in the townsite. Population, 254.

Balla Balla, on a creek of the same name, South of Depuch Island, is the nearest port to several of the goldfield centres in the West Pilbara district, and is also convenient for owners of sheep stations when loading sheep for the market. It lies 12 miles North from Whim Creek, and its distance from Roebourne is 55 miles. The Government have constructed a jetty 250ft. in length, at which there is about 17ft. of water. Machinery can be lightered to the shore. There are here two stores and public houses combined.

Bamboo Creek, formerly one of the principal reefing centres of the Pilbara goldfield, is about 100 miles from Condon, and 40 miles East of Marble Bar; it is connected with the latter place by telegraph, and has a weekly mail service. There are two stamp batteries, each of 10-heads, in operation. The townsite has been surveyed, but the township is at present practically deserted.

Bardoc.—This township is nine miles North of Broad Arrow. It contains a post office, two hotels, and a police station. Population, 235. The water supply is obtained from the Government dam, about one and a half miles East of the town. Bardoc has-

Digitized by Google

railway station on the Kalgoorlie-Menzies line. In the district is *Vettersburg*, situate about six miles North, with one hotel; also *Scotia Siding*, about 12 miles North, with one hotel.

BAYSWATER, *see* Perth.

BEAGLE BAY, *see* Broome.

BEJOORDING is a small township, situate about 18 miles North of Newcastle. Almost all the town lots have been bought up by farmers, and devoted to the raising of cereals and the breeding of pigs and other stock. The soil is very productive, and the rainfall ample. There are no public buildings in the township excepting a small school.

BELMONT, *see* Perth.

BEVERLEY is a small agricultural town, situated about 100 miles from Perth, on the main line between Perth and Albany. The population is 196, viz., 113 males and 83 females. The Government has erected a fine court-house and hospital. The surrounding land is for the most part rich, and suitable for agriculture and dairying. Large tracts, which previously were unimproved, are now undergoing rapid development. In this district there are permanent pools or reaches in the course of the River Avon, which runs through the town, making the neighbourhood one particularly suitable for fruit, irrigation, etc.

BLACK FLAG.—This township is in the Broad Arrow goldfield and is 10 miles South-West of Broad Arrow. There are a post and telegraph office and two hotels. The water supply is obtained from the Government dam. Salt water is obtainable at a depth of 30 or 40 feet, and a large tank is used for storage of water.

BONNIEVALE.—This township lies about seven miles North-East of Coolgardie, and has 238 inhabitants, mostly mining men. There are two large mines in active operation, and several smaller claims are being successfully worked. Bonnievale possesses three hotels, a public school, police station, telegraph station, and post office. A coach runs twice daily between it and Coolgardie.

BOORABBIN is a refreshment station, situated on the Perth-Coolgardie railway line. There is one hotel. A number of wood-cutters' camps are in the vicinity.

BORANUP is a timber station in the vicinity of Karridale. Population, 133.

BOULDER is now an important mining business centre. A railway connects it with Kalgoorlie. It has a post office and school. The population of the municipality is 4,601, viz., 2,724 males and 1,877 females. There are excellent hotels, stores, etc., in the township. A court-house is now erected at Boulder, and is visited by the resident magistrate from Kalgoorlie when his services are required.

Digitized by Google

Boyadine is an old agricultural settlement in the Beverley District, 115 miles East from Perth, and 15 miles by coach from Beverley. It has a post office.

Bridgetown is a small township on the Blackwood River, 61 miles by road from Bunbury. Until the discovery of tin at *Greenbushes*, about 10 miles distant, in the year 1888, it was purely an agricultural and pastoral centre. The climate is mild, with a regular rainfall, averaging over 34 inches per annum, and the soil is unsurpassed for all farm and garden produce. English fruits especially flourish throughout the district. The land in the vicinity is hilly, and timbered principally with red gum and jarrah. Surface water is abundant. There is a railway from Bunbury to Bridgetown, 69 miles in length. Population, 487.

Broad Arrow lies about 24 miles North-East of Kalgoorlie, and is the official centre of the Broad Arrow goldfield, which has its own warden and resident magistrate. Here there are post and telegraph offices, police station, eight hotels, two breweries, and branches of the Bank of Australasia and the Western Australian Bank. Population of the municipality, 343 males, 199 females; total 542. The water supply is obtained from the Government dam, capacity 10 million gallons, and various other sources. A deep alluvial lead has attracted a large influx of miners. The town is a municipality with a mayor and nine councillors, and is situated on the Kalgoorlie–Menzies railway line. In the district are *Windanya* (late *Australasia*), a mining centre about eight miles to the North-West; *Mount Pleasant* (late *Dead Finish*), about three and a quarter miles North of Black Flag; *The Dixie* and *Gladiator* groups, about nine miles North-West; *Liberty Camp*, about eight miles West; *Railway Venture* with one hotel; and *The Credo*, about four miles West, at which water fit for domestic purposes is found at a depth of 80 feet, and which has one hotel.

Broome, the principal cargo port, next to Cossack, on the North-West Coast, is situated in Roebuck Bay. The alternative cable of the Eastern Extension Australasian and China Telegraph Cable Company from Banjoewangie is landed here, and the Company has good buildings for its staff. This town is also the principal rendezvous of the vessels engaged in the pearling industry, being centrally situated, and possessing an excellent harbour, where the boats lie safely during the hurricane season. Population, 1,062, including the men of the pearling fleet. Amongst the public buildings are a Government residency, post and telegraph office, court-house, custom-house, bond, police quarters, and gaol. Water is laid on to the town and jetty from a 25,000 and a 15,000 gallon tank, filled by a steam pump. There is a fortnightly service of steamers to Fremantle and Singapore. A tidal jetty for steamers, with cattle yards and a tramway, have been constructed, and further shipping facilities are being provided. Owing to the great rise and fall of the tide (28 feet), steamers and other vessels beach and clean here. The climate is good, the heat in summer being tempered by strong sea-breezes blowing night and day.

Digitized by Google

At *Beagle Bay*, about 70 miles to the Northward, is situated a Roman Catholic Mission Station, founded in 1890 for the benefit of the aborigines.

BROOME HILL townsite is situated by rail 103 miles from Albany, and 237 miles from Perth, and is surrounded by some of the finest wheat growing areas along the Great Southern railway line. Lord Brassey's estate is only five miles distant from the town. The progress of this district might possibly have been greater, had not immense areas of rich land been sold without compulsory improvement conditions. Population of Broome Hill and surrounding district, 458.

BRUNSWICK is situated on the South Western Railway, 16 miles from Bunbury. It is a fairly important place, being the junction with the Collie coalfields. The principal buildings consist of a railway station, agricultural hall, post and telegraph office, Government school, and an hotel. Population, 255.

BULDANIA, *see* Norseman.

BULLABULLING is a small town on the Perth railway line, about eight miles from Coolgardie, and inhabited chiefly by wood-cutters, who supply Coolgardie and the various mines with wood. A large reservoir is being erected here in connection with the Coolgardie Water Scheme. The place has one hotel, and is the centre of a promising mining district. Population, 101.

BULONG is a rather pretty little town on the North-East Coolgardie goldfield. The streets and footways are well made and kept, and ornamental trees are planted on both sides of the streets. The natural timber and bush surrounding the town has been well preserved, giving the place a rural rather than a mining appearance. There is a large miners' institute attached to which is a reading room. The town is governed by a mayor and councillors. There is a good hospital. The water supply is obtained from the Government reservoir, condensers, and house-tanks. A group of gold-mining leases, situated about one mile West from the town, are being worked. A sensationally rich patch of gold-bearing material was discovered, at the end of last year, about half a mile from the town. There is a State school, also Roman Catholic and Wesleyan churches. The population of the municipality is 191, viz., 110 males and 81 females.

BUNBURY, a seaport on the Western coast, about 116 miles South of Perth, is prettily situated on a peninsula, bounded on the North and West by the Indian Ocean, and on the East by the Leschenault estuary. It has railway communication with Perth and Donnybrook; also with Busselton, distant about 30 miles South. The climate is almost perfect, the rainfall during the winter months being abundant, while the summer heat is tempered by daily sea breezes. There is excellent pastoral and agricultural land in the district, and fruit of all kinds grows luxuriantly in the vicinity of the town. The harbour facilities lately completed consist of a jetty 1,147 feet long, protected by a breakwater 3,200

Digitized by Google

feet in length. The jetty gives accommodation for eight vessels; the depth of water at the outer end being 21 feet, and at the inner end 15 feet, and any steamer 300 feet long or under can load down to 19 feet.

Bunbury is a favourite resort for visitors during the summer months. Its temperate climate, commodious sea baths, and the opportunities afforded for boating and fishing add to the attractions of those seeking a change and pleasant holiday. There are several good hotels and boarding-houses in the town. Population 2,455, viz., 1,229 males, 1,226 females.

There was a considerable export of timber (jarrah) from the port during 1901, cargoes to the value of £131,505 being shipped away in foreign vessels and intercolonial steamships during the year.

BURBANKS is due South of Coolgardie, about six miles. The Burbanks Birthday Gift Gold Mines are situated here. Besides the men employed on these mines, a large number are working successfully at smaller claims around the township. There are a number of large buildings at Burbanks, amongst which may be mentioned a miners' institute, three fairly large hotels, post and telegraph station, a police station, and a Government school. The township is in coach communication with Coolgardie, from whence the telephone system also extends. The mines here are illuminated by the electric light. The footpaths of the main street are neatly kerbed, and the sanitary arrangements of the township are excellent. Population, 629.

BURSWOOD, *see* Perth.

BUSSELTON, or, as it is more generally called, THE VASSE, is a small and picturesque seaport town, situated at the head of Geographe Bay, with Cape Naturaliste showing in bold relief away in the distance to the left. Excellent fishing can be had, and the lovely caves along the coast are well worth visiting. The bay itself, being nearly always calm, is a fit place for both small and large vessels to weather a gale. Busselton is connected with Bunbury by a railway, 42 miles in length, passing *via* Boyanup through forests of jarrah and tuart. The large patches of good land only require clearing to make this district an important centre of agriculture. The town itself can be favourably compared to Bournemouth, both as regards its climate and extensive and safe sea beach, where excellent bathing can be always had. Most English fruits are grown, and ripen well in the district. Population: 217 males, 235 females; total, 452. A new hospital has been erected lately.

The famous Yallingup Cave (*see* "Caves," page 130), to which coaches ply weekly during the summer, is within 19 miles of Busselton. Bathing and fishing are to be had a short distance from the cave in a natural basin formed by the coral rocks, enclosing a space of about 1½ acres. Further South are the Margaret Caves, which are famous for their stalactite formations, and in which the Government are now constructing stairs and bridges.

Digitized by Google

CAPEL is situated on the banks of the Capel River. Its distance from Bunbury is 17 miles by road and 28 miles by Government railway. It has a railway station and goods shed, agricultural hall, Government school, and post and telegraph office, also a public-house and store. The residents are but few, and the place is merely a centre for the surrounding settlers.

CARNARVON is situated at the mouth of the Gascoyne River, and is the shipping port for the wool produced in that extensive pastoral district, and the starting point for the Bangemall diggings, 260 miles inland. The public buildings consist of a court-house, schoolhouse, bonded store, residency, gaol, post office and telegraph station, church, library, and hospital. It has three hotels and two stores. The town is well supplied with water. Population: Males, 186; females, 104; total, 290.

CHIDLOW'S WELL, 28 miles from Perth, is now a centre for wood cutting and charcoal burning, with a population in the immediate vicinity of about 150 to 200. There are there a telegraph station, post office, Government school, and one wayside house.

CLACKLINE is the junction of Newcastle-Clackline and the Eastern railway. Until quite recently the place was a thriving settlement, but since the closing of its iron quarries it has dropped back. It possesses a public school, which has a good attendance, a hotel, and a few private residences. The soil and the rainfall are excellent.

CLAREMONT is situated midway between Perth and Fremantle, with Freshwater Bay, a portion of the Swan River, as its Southern boundary. The Bay is a beautiful sheet of water. The Perth-Fremantle road runs through the town: nearly all the streets have been cleared, and about ten miles have been metalled. The growth of Claremont has been very rapid; the buildings and improvements generally being of a substantial nature. One of the features of the town is, that while handsome well-built houses abound, the native *flora* still exists in profusion, and adds greatly to its beauty. There are two hotels, and a third one is in course of erection. The water supply is obtained from the Osborne bore, whilst electric light for public and private use is supplied by the Claremont Electric Light Company. Arrangements are being made for the erection of public baths. There is a fine jetty in Freshwater Bay. The population consists of 1,038 males and 976 females; total, 2,014.

COLLIE is a municipality, and the centre of the Collie coalfield. It possesses three places of worship, Anglican, Roman Catholic, and Wesleyan. A branch was opened by the Commercial Bank of Australia in October, 1900. There are further, a hospital taken over by the Government in July, 1901, a post and telegraph office, police station, State school, and court-house. The township is gradually assuming a more settled aspect; but, owing to the miners, as a rule, availing themselves of the "residence" leases issued by the Lands Department at a rental of 10s per annum, the population is somewhat scattered. The Government sales of town and suburban

Digitized by Google

lands have realised about £14,000, as much as £165 having been bid for a quarter-acre lot, while at private sales small frontages have brought even higher prices. Population of the North Town (census district) 772; South Town, 580; total, 1,352.

CONDON, formerly known as SHELLBOROUGH, is named from the creek on which it is situated, and lies on the sea coast, 100 miles from Marble Bar. It is here that most of the stores and machinery are landed from small coasting vessels and lighters. The place has a telegraph station, a weekly mail service, and frequent communication with Roebourne. It has, in addition, one hotel and several stores. Population, about 50.

COOGEE.—This is an agricultural settlement, situated about seven miles from Fremantle. It contains a large lake of fresh water, and a great quantity of vegetables and fruit are grown in the district.

COOGLEGONG TINFIELD, situated 45 miles South-West of Marble Bar and nine miles North-West of the old Shaw Tinfields. This field has produced a large quantity of stream tin. There are about 130 fossickers on the field, and the place has one store.

COOKERNUP is a townsite on the South-Western railway, 34 miles from Bunbury. It has a railway station, agricultural hall, Government school, and post and telegraph office. Population, 156.

COOLGARDIE, the township from which the now famous Coolgardie Goldfields originally derived their name, is situated about 114 miles East of Southern Cross, and is the headquarters of the warden of the Coolgardie Goldfield. It is also a municipality, represented by a mayor and nine councillors. In the municipality there are a number of imposing buildings, built of brick and stone, many of which are used as the offices of mining companies. There is also a club, a stock exchange, and a Chamber of Mines. There are six banks in the town, fifteen large hotels, a large number of stores, some minor factories, two small theatres, several churches and schools, a large Government hospital, and a mechanics' institute, with a library of 2,700 volumes. The building lately used for the Coolgardie Exhibition, and which is substantially built of stone, is about to be utilised for the purpose of a School of Mines. Coolgardie possesses a daily morning paper. An imposing block of Government buildings, in which the courts of the warden and the resident magistrate are held, as also the Quarterly Court of the General Sessions of the Peace, stands in the centre of the principal street. The town has telegraphic communication, and is connected with Perth by a railway, which extends to Kalgoorlie, Kanowna, and Menzies, and is at the present time being pushed further inland. There is also a telephone exchange, which is connected with Kalgoorlie and Boulder. Within a few miles of the town a large number of gold mining leases are being worked, some of which possess rich reefs and numerous batteries, and other gold-mining appliances are now in active operation. Sawmills, brick and tile works, and two large breweries are established in or near the town,

Digitized by Google

and good building stone is locally quarried. Fresh water is obtainable, but the main supply is derived from condensing plants. The Coolgardie racecourse, where race meetings are held twice annually, is situated about three miles North of the town; it has a fine grandstand and all the latest conveniences. The town is well laid out, the streets being all two chains wide, and the footpaths of the principal street tar-paved. It is illuminated with twenty-three 2,000 candle-power arc lights, and is planted with trees and kept in a most cleanly condition. In the park lands, where ornamental trees, shrubs, and flowering plants are now growing well, a rotunda has been erected, and comfortable seats have been placed in different positions for the use of the public. The recreation reserve is kept in splendid order, and every requisite convenience is to be found there. Careful provision has been made for an adequate supply of water in case of fire, and the municipal council has an efficient and well-equipped volunteer fire brigade. *Toorak* and *Montana*, suburbs lying to the North and South of the town, contain many pretty residences. The swimming baths, which are under the control of the municipal council, have proved a great boon to the residents. Coolgardie was proclaimed a municipality in November, 1894. Within the municipal boundaries the population at the census was found to consist of 2,403 males and 1,846 females, total 4,249.

Cossack, the port of Roebourne, is situated on the North bank of a large tidal creek, which receives the flood waters of the Harding River and tributaries. A tramway carries passengers and goods to Roebourne, about nine miles away. The anchorage is an open roadstead, and only vessels under 200 tons can come alongside the wharf; lightering being necessary for larger ships. The town possesses some good public buildings, including customs and police quarters, courthouse, post and telegraph offices, and Government school, all substantially built of stone. Population, 127 males; 39 females; total, 166.

Cottesloe is one of the principal suburban districts on the Perth-Fremantle railway line. It is situated about eight miles from Perth and four miles from Fremantle, and consists of three contiguous roads board districts, namely, Cottesloe, Peppermint Grove, and Buckland Hill. It has two railway stations, Cottesloe and Cottesloe Beach. The Cottesloe Roads Board district comprises that portion of the suburb which lies on the sea-side of the Perth-Fremantle road, and includes both the original settlements of Cottesloe and Cottesloe Beach. It is one of the leading seaside resorts in Western Australia. It has a large park reserve, and a mechanics' institute, besides a public hall. Peppermint Grove is a charming residential suburb of Perth, situated on the banks of the Swan River at Freshwater Bay. There is a large hall suitable for public and private entertainments, and recently a splendid site of some 10 acres has been secured for a public park, and has already become a great resort for picknickers. There are boating and bathing clubs established. Buckland Hill extends from Cottesloe

Digitized by Google

Beach station to the Swan River, and adjoins the Northern boundary of the North Fremantle Municipality. Buckland Park commands most beautiful views of the river and ocean. In the centre of the district there is an excellent recreation ground. The population for the three districts amounts to 2,810, of whom 1,435 are males and 1,375 females.

CUDDINGWARRA, a mining township situated about nine miles West of Cue, has postal and telegraph communication, and good hotel accommodation is obtainable. Good water for household purposes is obtained from wells about two miles from the town. Population, 59.

CUE is at present the terminus of the railway from Geraldton, but the line is now being extended to Nannine. Besides the mining industry in and around the town, a large area of the surrounding country is occupied for pastoral purposes. A large amount of gold is annually exported from Cue. Public buildings are erected of stone and lime obtained locally, and comprise a post and telegraph office, Warden's Court-house, police offices, etc. The winter climate is excellent. There are two public crushing plants, and though the supply of water for mining purposes is limited in some places, an ample supply for domestic purposes is obtainable.

There are several churches in the township. Population, 755 males, 436 females; total, 1,191.

DANDARAGAN is a rural settlement noted for its pastoral and agricultural capability, somewhat resembling Yatheroo, from which it is situate some 10 miles distant. Considerable attention is here devoted to the growth of cereals, and also to the manufacture of butter. Moora, situate some 20 miles West, is the railway township through which the greater part of the Dandaragan business is transacted. The place is more thickly populated. The soil here is somewhat richer than that at Yatheroo. The rainfall is good, and the roads are excellent. Dandaragan possesses a post office and public school. Population, 148.

DAVYHURST, a flourishing mining centre, is situated about 35 miles South-West of Menzies, and has a weekly mail and a tri-weekly passenger coach. It has telegraphic communication with Coolgardie. There is ample hotel accommodation. The Bank of Australasia has opened a branch here. There are some very promising mines in the vicinity.

DAY DAWN, situated some four miles South-West of Cue, is a mining township which possesses some good gold-bearing reefs in its vicinity. During the last twelve months the town has advanced considerably, and a large number of gold-mining leases have been taken up, while on the older mines some fine plants are being erected. Day Dawn has postal and telegraphic facilities, and is on the Cue railway line. Branches of the Western Australian and Union Banks are established. The affairs of the town are under the control of a municipal council. Good water is obtainable by sinking. Population: 260 males, 93 females; total, 353.

Digitized by Google

DENMARK.—This settlement is prettily situated on the Denmark River, at a distance of 38 miles from Albany, and there is a daily service of trains to the latter place. It is the property of "The Millar Karri and Jarrah Forests Company, Limited," and consists for the most part of the houses of their chief employees, stores, workmen's residences, etc. There are also a Government school, post and telegraph office, public hall, and other buildings. As the karri forest is cleared, no doubt most valuable land for agricultural and fruit-growing purposes will be opened up. Population, 785.

DERBY, the chief town of the West Kimberley District, is situated on King Sound, not far from the mouth of the Fitzroy River. It has a fine natural harbour, with which it is connected by two and a-half miles of tramway. The chief products of the district are wool and live stock, the number of the latter shipped from the port having largely increased during the last two years. Large numbers of cattle and sheep are annually sent away, chiefly to Fremantle, a small number occasionally going to Singapore, which offers a good market within easy reach. The facilities for shipping cattle have been greatly increased by the erection of cattle yards and races. The township has an excellent water supply. There are in Derby two hotels, and the Government buildings in use by the various departments include a post and telegraph station and savings bank. At the Fitzroy Crossing, on the road to Hall's Creek, there is a telegraph station communicating with Wyndham and with the other telegraph services of Australia. There are good roads up the Lennard and Fitzroy Rivers, passing through various sheep and cattle stations. The district contains some of the finest pastoral country in Western Australia, well watered, and abounding in game. Population, 98. In addition, about 150 people are engaged in pastoral pursuits in the outlying parts of the district.

DONGARA, a picturesque little town about 42 miles South from Geraldton, is the centre of a thriving agricultural settlement, with a population, including Port Denison and Irwin, of 500 persons. It is on the Midland line of rail between Perth and Geraldton, trains passing through every day. Steamers call occasionally at Port Denison, two miles from Dongara. There are Anglican, Roman Catholic, and Wesleyan churches, and a Government school. Good flour mills have been erected, and there is a branch of the Western Australian Bank in the town.

DONNYBROOK is a small town situated about 25 miles South of Bunbury. It is on the Bunbury-Bridgetown railway, and has a railway station, agricultural hall, Government school, police station, post and telegraph office, three hotels, and stores. It is the key to the Upper Preston River country, which has a fair amount of land under cultivation, and where it is anticipated a timber company is likely to start operations in the near future. Population, 748.

DRAKESBROOK is 18 miles by road and rail South of Pinjarra. A post office and agricultural hall have been built, and

Digitized by Google

several saw mills started in the ranges, which at this point allow of easy approach to settlements in them. There is good land in the neighbourhood, which is being rapidly taken up. Religious services are held by the Anglican Church and other denominations. Efforts are being made to build a church. The nursery gardens laid out in the neighbourhood by the Government, which are in a flourishing condition, are a source of attraction to many. Population, 100.

DUNDAS townsite, situated 15 miles South of Norseman, on the Esperance road, was the centre of the early mining operations on the Norseman field. The township has postal communication.

EAST BEVERLEY is situated about 13 miles from Beverley, and is an agricultural settlement. It has a State school, and is under the care of a roads board. Population, 275.

EAST FREMANTLE—including the districts of Plympton, Richmond, Brighton, Richmond Hill, and Windsor—was proclaimed a municipality in 1897. The town has a population of 1,324 males, 1,170 females; total, 2,494. It is rapidly increasing in size and importance, its salubrious situation, overlooking the Swan River and the ocean, making it a favourite residential area for the business men of Fremantle; many fine residences are situated within its limits. There are two churches (Wesleyan and Presbyterian), several hotels, stores, shops, two breweries, etc., in the town. It is governed by a mayor and council. In the suburbs are several fine orchards and vineyards.

ESPERANCE is the principal town of the Esperance district, which district extends from the Hamersley River to Eucla. It is 237 miles East from Albany by sea, 112 miles from Dundas, and 126 miles from Norseman. The town is a municipality, and has a population of 174 males and 167 females; total, 341. There is a large and safe natural harbour, completely sheltered by numerous islands, giving it, from the town, the appearance of being landlocked. There is a weekly mail steamer from Albany, and sailing vessels call. A fast coach runs through to Coolgardie (236 miles), the time taken being Esperance to Norseman 34 hours, and Norseman to Coolgardie 29 hours, twice a week. The Western Australian Bank has a branch here. Several of the large wholesale firms from Adelaide and Melbourne have opened branches. There is a second township about two miles North of the Government township, laid out by the Esperance Bay Land Company, with a jetty giving 23 feet of water at low tide. The recently-extended Government jetty is over 2,000 feet long, and has four berths. The Government buildings are: Court-house, post-office, public works offices, a large stone school, customs offices, and extensive goods sheds with enclosed yards, four acres in area. A splendid water supply has been laid on to the jetty for steamers. There is a Government hospital.

EUCLA is a small settlement on the Eastern boundary of Western Australia, about 520 miles East of Esperance, and about

Digitized by Google

an equal distance West from Adelaide. The West Australian and South Australian Governments have each a telegraph station here. It possesses a good anchorage in the roadstead, which was surveyed in 1867 by Captain Douglas. A steamer from Esperance calls every three months, and a sailing vessel from Albany makes intermediate trips, calling *en route* at Bremer Bay, Esperance, and Israelite Bay. Population, 67. There is a small jetty, handsome stone telegraph offices, and a customs office. The country around is described as good for pastoral purposes, but the want of water prevents successful operations.

EYRE'S SAND PATCH, about half-way between Israelite Bay and Eucla, is a transmitting station on the intercolonial telegraph line. The roadstead is fairly safe, except in the case of Southerly winds.

FALKIRK, *see* Perth.

FANNY'S COVE is a small settlement 40 miles West of Esperance. A schooner calls there once a month.

FIELD'S FIND, an important mining centre on the Yalgoo goldfield, is situated 70 miles South-South-East from Yalgoo. It has extensive pumping works and a 20-stamp battery, now crushing with good returns. There are two hotels, stores, etc., in the township. Population, 189. Field's Find has a weekly mail service with Yalgoo.

FREMANTLE, the chief port of the State, is situated at the mouth of the Swan River, about 12 miles from the capital (Perth). The natural harbour is not well suited to afford shelter to vessels; but the carrying out of the great harbour works scheme, designed by the Engineer-in-Chief of the State, the late Mr. C. Y. O'Connor, C.M.G., has converted the sandy and shallow mouth of the Swan River into a safe and commodious haven. Huge breakwaters have been constructed on each side of the river's mouth for a considerable distance into the sea. The rocky bar at the entrance to the river has been [illegible] and the shallow water within has been dredged [illegible] the largest mail boat entering. [illegible] Australia now [illegible] harbour. Nearly a [illegible] and the Victoria [illegible] the finest and most [illegible] been [illegible] in [illegible] the [illegible] with accom- [illegible] [illegible] [illegible]

Brindisi of Australia. The town possesses numerous churches, chief amongst which are St. John's Anglican Church, and St. Patrick's Roman Catholic Cathedral. Each of these edifices is a fine example of Gothic design. Banks, schools, warehouses, and public buildings are well represented, and in the vicinity of the town are extensive smelting works. There is also a fine stretch of ocean beach, together with an esplanade. The climate of Fremantle is excellent in summer, the sea breezes, which blow with almost perfect regularity, cooling the atmosphere very considerably. The population of the Fremantle municipality at the census of March, 1901, was 8,366 males, and 6,342 females; total, 14,708.

Freshwater Camp or Denham, the chief seat of the Shark Bay Pearling industry, is 80 miles South from Carnarvon, on the telegraph line. The public buildings are a police station, telegraph station, and schoolhouse. It has one hotel and several small stores. The coastal steamers, which, as a rule, pass about 20 miles from the camp, and land their cargo at Dirk Hartogs Island, occasionally call in here. Sandalwood-cutting is carried on in the neighbourhood of the camp. Fresh water is obtainable on the beach. Population of the Shark Bay Census District, 198.

Geraldton, the chief town of the Victoria magisterial district, is situated in Champion Bay, about 210 miles North of Perth, and is the port of a rich agricultural, pastoral, fruit-growing, and mining area. The extensive goldfields of the Murchison have materially increased the prosperity of the town, and here the wool produced in the outlying districts is shipped. The population of Geraldton is 1,287 males and 1,171 females, total 2,458; and to this number must be added about 500 engaged in farming, fruit-growing, and pastoral pursuits, within a radius of about 20 miles from the town. Direct, frequent, and regular steamship communication is established with all ports of the State, and also with the Eastern States, and England *viâ* Singapore. There is a daily service of trains between Geraldton and Perth. Trains run between Geraldton and Northampton. A line of rail is now constructed between Geraldton and Cue, the centre of the Murchison goldfields, and trains run frequently. There are four churches: Anglican, Roman Catholic, Wesleyan, and Presbyterian. There are branches of the Union, National, and Western Australian banks, and five excellent hotels. The town has municipal chambers, Government offices, and a local hospital. It possesses an efficient fire brigade and two engines. There are two fine jetties, one reserved as a pleasure resort, the other being used for mercantile purposes. A fair supply of fish is caught in the bay and near the Abrolhos Islands, about 40 miles West from Geraldton. These islands are rich in deposits of guano.

Gingin, a small township on the Midland Railway, about 50 miles North of Perth, is the centre of a rich agricultural district. The land seems particularly favourable to the cultivation of the orange, some of the finest in the State being produced there. The township stands on the Gingin Brook, a stream which

Digitized by Google

[illegible] throughout the whole year and discharges itself into the Moore River. Gingin is a municipality. The population is 96 males and 61 females: total 157. There are here a railway station, schoolhouse, hotel, post office, police station, two stores, an Anglican church, Wesleyan church, and about 40 dwelling houses. Wallaby, kangaroo, and duck abound in the vicinity of the townsite, and afford excellent shooting for sportsmen.

Goomalling is a coming district, offering every inducement to the selector. It is situate N.E. from Newcastle about 30 miles, and is connected with Northam, 30 miles off, by rail. Of late extensive settlement has taken place, with most satisfactory results. The soil is excellent, and the rainfall of good average.

Goongarrie, formerly known as the 90-Mile, is on the railway to Menzies, and about 26 miles South of that town.

Gooseberry Hill has, within the last few years, become a great strawberry-growing centre. There is a Government school and post office, and a train service twice a week over the Canning Jarrah Timber Company's line from Midland Junction. The population within a five-mile radius is about 300.

Grass Valley is a rising township 12 miles East of Northam, on the Yilgarn line. The cutting up of the Throssell area of 17,000 acres of fine land surrounding the place has given a great impetus to the district. In the neighbourhood are some very fine farms, on some of which irrigation is practised. The township has postal and telegraphic communication, an agricultural hall, a Government school, and an hotel. There is also a race club and an athletic club.

Greenbushes is the centre of the Greenbushes tinfield. It has a court house, registrar's office, post and telegraph office, public school, miners' institute, and smelting works. Population, 670.

Greenhills is an old agricultural settlement in the York district, 91 miles S.E. from Perth, and connected with the town of York by a line of railway 14 miles in extent. Most of the good land has been taken up for cultivation. The principal products are hay and corn. All kinds of stock are raised on a limited scale. There are two good orchards in full bearing. Greenhills has [illegible] State school, [illegible] Anglican and Wesleyan [illegible] are attended to by a [illegible]

[illegible] agricultural [illegible] 450.

[illegible] Perth.

business in the city. The population is steadily increasing; at the recent census it numbered 718 males, 741 females; total, 1,459. There is here a court-house, police station, post and telegraph office, railway station, mechanics' institute, and other public buildings. The places of worship are an Anglican Church, a Roman Catholic Chapel, and a Wesleyan Chapel.

GULLEWA, a township and important mining centre, is situated 40 miles South-West of Yalgoo, on the Yalgoo Goldfield. Population, 120. There is a bi-weekly mail service to Yalgoo, and telegraphic and telephonic communication. The town contains two hotels and several stores. A Government school has been opened.

HALL'S CREEK is the official and business centre of the once flourishing Kimberley Goldfield, and has a population of 38 inhabitants. The public buildings consist of a residency, warden's quarters, post and telegraph office, court-house, miners' institute, and police station. It is connected with Perth by telegraph, and is situated about 304 miles East of Derby, and 213 miles South of Wyndham. The population of the Kimberley Goldfield district is 95. The cattle stations on the Behn, Denham, Panton, Margaret, Elvire, and Ord Rivers, and on Turkey Creek and Sturt Creek are in a most flourishing condition, and are at present partially supplying the Perth and other Southern markets.

The alluvial still keeps a few fossickers engaged. The road from Wyndham to the field is well watered, and there is plenty of food for stock. The climate is very good on the field; there is excellent water, and no fever or climatic diseases prevail. There are two mails every month, one from Fitzroy, the other from Wyndham. A post office has been opened at Turkey Creek, on the Wyndham Road, which facilitates the line-repairing work and prevents the previous vexatious delays.

HARVEY is an agricultural settlement. In the vicinity are the Yarloop and other saw mills, and in the district are the drainage works recently undertaken by the Government. There is an agricultural hall. The population in the Murray district is 280, and in the Wellington district 115.

HOFFMAN'S MILL is a timber station at a distance from Bunbury of 36 miles by Government railway, and nine miles by the Millar's Karri and Jarrah Forests Company's private railway line. It is situated at the base of Mt. William. The people living at this mill are all employees in the timber trade, and the Government has established a school at the place for the benefit of their children. The mill is connected by private telephone with other centres. Population, 190.

HOPETOUN, *see* Ravensthorpe.

IRISHTOWN, about five miles North-West of Northam, is the centre of an old-settled and thriving agricultural district. The principal buildings in the townsite are the Agricultural Hall, the Roman Catholic church, and a small schoolhouse. Population, 447.

Digitized by Google

ISRAELITE BAY is 185 miles East from Esperance, with which it has communication once a fortnight by steamer. It has a post and telegraph office. There is a good harbour, but it is somewhat exposed.

JANDAKOT, which is situated about eight miles from Fremantle, is the chief centre of the Fremantle agricultural district. It is connected by road with Fremantle, and has an agricultural hall which at present is also utilised as a school. There is also a church and an hotel. There are some excellent vegetable gardens in the district. The land is in many parts swampy, and there are two very fine lakes of fresh water, known as Bibra Lake and Jandakot Lake. These contain water all the year round. Population, 825.

JARRAHDALE is a flourishing and busy timber station, worked by the Rockingham Railway and Jarrahdale Timber Company, situated in the Murray District, seven miles from Jarrahdale Junction on the South-Western Railway, and about 30 miles from Perth. The timber is shipped from the port of Rockingham, to which it is conveyed by rail. Population, 824. There are several good stores and two Government schools. Anglican and Wesleyan churches have been erected. There is also a public library and reading room and assembly hall. The timber company work four large mills. As a health resort, Jarrahdale is largely patronised during the summer months. There are two good hotels. A Masonic temple has recently been erected. In the neighbourhood are the Whitby Falls.

JARRAHDENE is a large timber station owned by the M. C. Davies Co., Ltd., connected with Port Augusta and the Hamelin by a railway line, which passes the mills at Boranup and Karridale. All these places are within 30 miles of Busselton. Population, 92.

KALGOORLIE, 380 miles East of Perth, is one of the principal towns of the Eastern goldfields. It is the headquarters of the warden of the East Coolgardie Goldfield, and is the scene of the most active mining operations in the State. The country for about five or six miles South and a mile or two North has been almost wholly taken up under gold-mining leases. A large quantity of crushing machinery is now in operation, there being something like 400 stampers at work, besides Huntington mills, Krupp's ball mills, and cyaniding plants, and the celebrated *Brown Hill*, *Kalgurli*, *South Kalgurli*, *Associated*, *Great Boulder*, *Lake View*, *Ivanhoe*, *Associated Northern*, *Golden Horseshoe*, and *Boulder Perseverance* mines are in the vicinity. Kalgoorlie supports three newspapers. The town is a municipality, represented by a mayor and nine councillors. Electricity is used for lighting the streets, the plant belonging to the municipality, the profits going towards the general improvement of the town. Water is supplied from condensing plants erected on the mines. Lines of railway connect Kalgoorlie with the Boulder, Kanowna, and the mining townships to the North. Population,

Digitized by Google

within the municipality, 4,039 males, 2,613 females; total, 6,652. There is a railway in course of construction to Mount Malcolm; a loop line has also been constructed to Brown Hill, where a number of free areas have been thrown open for residential purposes. Electric tramways are being constructed from Kalgoorlie to Boulder, and to the different suburbs—Piccadilly, Lamington Heights, Mullingar, etc. Swimming baths have been completed.

KANOWNA, formerly known as "White Feather," is situated 12 miles North-East of Kalgoorlie. It is the headquarters of the warden of the North-East Coolgardie Goldfield. There is a post and telegraph office, money order office and savings bank; a Government hospital, miners' hospital, State school, Wesleyan, Anglican, and Roman Catholic churches, and a miners' institute. The town is lighted by electricity, and the sanitary arrangements are fairly good. Extensive quarters have been provided for the warden and inspector of mines, and a court-house and Government offices have been erected. The railway connects Kanowna with Kalgoorlie, Coolgardie, and Perth. The water supply is derived from the Government reservoir, condensers, and wells, and after heavy rains fresh water is obtainable from claypans for many months. About 195 head of stamps and several other gold reduction plants are in active working. The town supports branches of the Western Australian and Union Banks, seven hotels, and numerous shops and warehouses. It has further a Freemasons' Hall, a reading room, and a racecourse with a commodious grand stand. It is a municipality under the control of a mayor and nine councillors. Population of municipality, 629 males, 415 females; total, 1,044.

KARRIDALE is a large timber station, and is situated by road 50 miles South by West of the Vasse. It is connected by a tramway line with Port Hamelin, from which is shipped the valuable karri timber cut upon the station. In the neighbourhood of the mills are extensive swamps, and about eight miles away flows the Blackwood River, the home of swan and duck. A most interesting and peculiar natural phenomenon is to be seen in this neighbourhood; the walls or banks of sand, from two to three miles long, and from 70 to 90 feet high, are gradually advancing from the seaboard over the land at the rate of about one to three inches a year. Between this place and the Vasse signs of coal have been found. The population of Karridale varies with the ups and downs of the timber trade; at the time of the recent census it numbered 230. Upon the renowned Cape Leeuwin, the most South-West point of the State, which is situated about 23 miles from Karridale, a lighthouse of the first class has been completed. The light is visible at a distance of 23 miles, and thereby the neighbouring waters are rendered comparatively safe. Port Hamelin, in the vicinity of Karridale, has a population of 55 persons.

KATANNING is a townsite on the Great Southern Railway, situated by rail 225 miles from Perth, 115 miles from Albany, and 127 miles from Beverley. There is excellent agricultural land in

Digitized by Google

its vicinity, and a Government land agency has been opened. The land is being rapidly taken up under the Homestead and other Acts. From the 20th March, 1897, to the 31st December, 1901, the following applications have been received at the local Lands Office:—2,235 ordinary first-class Conditional Purchases for 336,182 acres; 801 Homestead Farms for 127,156 acres; 85 second-class Conditional Purchases, 101,302 acres; 61 third-class Conditional Purchases, 80,655 acres; 28 poison leases for 32,994 acres; 148 pastoral leases, 501,394 acres; 2 special leases, 1 quarrying license, 453 town lots, 147 ordinary suburban lots, 99 suburban lots for cultivation, 341 transfers, 301 Crown grants, and 170 applications for loans from the Agricultural Bank for £23,875. The total receipts for rents and deposits on applications amounted to £35,417. The above return includes selections East and West of the Great Southern Railway line from Mount Barker on the South to Pingelly on the North. Fruit culture is being largely entered into in this district, and both soil and climate appear to be most suitable to the several varieties of English fruit. A large roller flour-mill is also kept in active operation, grinding wheat produced in the district. Settlement of the land in the vicinity of the railway has received a great impetus since the purchase of the line by the Government. Population of Katanning and surrounding districts, 1,061.

Kojonup, one of the older townsites of the State, is situated on the old mail coach road between Albany and Perth, about 160 miles from the metropolis. This district is coming to the fore, as its stock-raising capabilities are now greatly appreciated. The recent agricultural shows have proved the good quality of the young stock—horses, cattle, and sheep—produced in the Southern districts. For cereals, fruit and vegetables the land has been found very suitable. Kojonup has a post office, school, and agricultural hall. Population of district, 164.

Kookynie is a flourishing mining centre about 37½ miles N.E. of Menzies. There are six hotels, two banks—branches of the "Union" and "W.A."—post and telegraph offices, a registrar's office, police station, and public school. There are four batteries at work, representing 65 head of stamps. Water for crushing is obtained from the mines, that for domestic purposes from fresh water wells in the immediate vicinity. Kookynie is connected with Perth by rail, and has a daily mail service. Warden's and local courts are held monthly. Population, 677.

Kunanalling is situated about twenty-five miles North by West of Coolgardie, and is an important mining township. It has four large mines in active operation. There are three hotels, a police station, post and telegraph offices, a public school, and many private residences. There is coach communication once daily with Coolgardie. Population, 444.

Kurnalpi, about 40 miles East of Kanowna, is now almost deserted. There is still one hotel, a police station, Miners' Institute, and telephone office. About 40 alluvial miners are working around

Digitized by Google

the locality. Potable water is obtained from a shaft some three miles away. *Mulgabbie* is situated about 36 miles North-Easterly; here a wayside house exists, and there are 30 to 40 miners working claims. About 13 miles Westerly from Kurnalpi are the Jubilee leases, where the only ore-reduction machinery in the district is working. Water is obtained here by condensing.

LALLAROOKH, to the North-West of Marble Bar, and South-West of Cook's Bluff, is a promising reefing centre. There is splendid pastoral land in the vicinity. It has an hotel and stores. A 10-head battery and Tremain mill have been erected in this district. Population between 40 and 50.

LAVERTON is an important and growing town, 23 miles in a straight line E.N.E. from Mount Morgans, and 25 miles by the Government cleared road. It is the business centre for a large number of outlying mines, including the "Ida H.," "Lancefield," "Craiggiemore," "Euro," "Augusta," and "Childe Harold." A registrar's office is established here, and a warden's and a local court are held. Post and telegraph offices and police station and quarters have been provided. Branches of the W.A. Bank and Bank of Australasia carry on business in the town. Besides numerous shops, there are four hotels. A daily coach runs between this town and Mount Morgans to meet the coach from Malcolm. Population, 405.

LAWLERS, the principal town of East Murchison Goldfield, is 97 miles North-West of Malcolm and 170 miles East of Mount Magnet. Population, 749. The public buildings are:—Warden's court and offices, post and telegraph offices, Union Bank, Miners' Institute, hospital, and Government school. There are six hotels, a brewery, and a number of stores. A weekly newspaper is published in the town. The mail services are:—A bi-weekly with Mount Malcolm, a weekly with Mount Magnet, and weekly mails with the outer centres—*Kathleen*, *Kingston*, *Leinster*, *Ogilvie's*, *McCaffrey's*, *Sir Samuel*, *Virien*, *Wiluna* (Lake Way), and *Woodarra* (Lake Darlôt).

LEEDERVILLE, a municipality to the West of Perth, is one of the most flourishing suburban towns in the vicinity of the metropolis. It is governed by a mayor and council, and is increasing in population at a rapid rate. At the 1901 Census it numbered 1,331 males, and 1,215 females; total, 2,546.

LENNONVILLE is situated about eight miles North of Mount Magnet, and is a most promising gold-mining town, the reefs going down strong, and being rich in gold. The railway runs through the township, which has a post and telegraph office. A Government battery and cyanide works have been erected here and are kept well employed. There are also several privately owned batteries crushing for the public. Population, 512.

LEONORA is an important township in the Mount Malcolm district of the Mount Margaret Goldfield. It is situated twelve miles West of Mount Malcolm, and is the centre of a number of

Digitized by Google

important mines, which lie within a radius of five miles. There is a post and telegraph office, and police quarters, and there are five hotels and several stores in the town. The railway connects this township and Mount Malcolm with Perth *viâ* Menzies. The *Sons of Gwalia* mine is two miles from the town. Leonora was proclaimed a municipality towards the end of 1900. A local court is held here on the second Tuesday in each month. Branches of the West Australian and National Banks are in existence. Population: Males, 225; females, 89; total, 314.

LOWER NICOL is about 12 miles West of Roebourne. About 10 years ago a large amount of alluvial gold was obtained here. Since then several gold-mining leases have been worked, and the present prospects are said to be extremely hopeful.

LUNENBERG is a station on the railway between Brunswick Junction and Collie, with a stationmaster's house and half a dozen platelayers' cottages; there is no settlement in the immediate neighbourhood, but at *Worsley Siding*, about a mile nearer Collie, the "Imperial Jarrah Timber and Wood-paving Corporation" have one of their mills. The company has three mills in this neighbourhood, employing 190 men. The company's trade is chiefly export. The total population is estimated at 600.

MANDURAH, picturesquely situated on the shore of Peel's Inlet, an estuary of the Murray, into which flow the Serpentine and Harvey Rivers, is on a limestone formation, similar to Fremantle. The waters abound with fish kingfish, whiting, and mullet being the best There is plenty of good land in the neighbourhood awaiting cultivation The place has telegraphic communication and hotel accommodation, which advantages, combined with excellent fishing, boating, and fine scenery, make it a desirable resort for town visitors There are a church and an Agricultural Hall Mandurah is only 12 miles from Pinjarra, and there is a good hard road nearly the whole distance The mail coach leaves four times a week, and also takes passengers Population, 115

MARBLE BAR is the [illegible] town of the Pilbara Goldfield district, and is the seat of the warden and resident magistrate. It has a weekly mail service, and is connected with Perth by telegraph [illegible] [illegible] Marble Bar is some of [illegible] [illegible] [illegible]

Wednesday in every month. The hospital and public offices are commodious structures. A miners' institute has lately been erected.

Maud's Landing is in the Ashburton magisterial district. It is an open roadstead, with a reef which forms a protection from Southerly winds, situated about 60 miles North of Carnarvon, but South of the North-West Cape. A jetty 1,500ft. long has been built here to accommodate two schooners, with a maximum depth at high tide of 17ft. At the end of the jetty a large shed has been erected to facilitate the shipping of wool from the surrounding sheep stations. Large ships can anchor safely some distance out with 22ft. at low water, and be lightered from the shore.

Meckering is a rising township on the Yilgarn railway line, about 23 miles East of Northam. It is the centre of the Meckering farming area. It has a fruitful light soil, which was formerly considered unfit for agriculture. The district is now closely settled, chiefly by farmers from the Eastern States. Heavy and early yields of hay are obtained. The township comprises, amongst other buildings, a post and telegraph office, a Government school house, where the average attendance is 40, an agricultural hall, an hotel, and several private residences. The population is about 150.

Menzies is the chief town of the North Coolgardie Goldfield, and is situated about 92 miles North of Coolgardie. It is the head quarters of the Warden, and is a municipality. The Government buildings consist of warden's and resident magistrate's court-houses, post and telegraph and other offices; a Government hospital, police station, and railway station. There are several batteries at work, representing 118 head of stamps. Water for crushing purposes is obtained from Lake Barlee, situated about six miles North-West of the town. Water for domestic purposes is procured from fresh water wells at Picton, about three miles East of the town, where a fairly plentiful supply is available. The water supply is further augmented by the water conserved in the Government tank, which is constructed of concrete, and has a capacity of 3,049,410 gallons, and is situated about one and a half miles South-East of the town. Also the Menzies Water Supply Co., Ltd., condense the salt water from the lakes, and have a large supply of tanks in the town. Contained in the town are 10 hotels, four churches, Salvation Army barracks, a Masonic hall, two banks, a town hall, and a public library. A volunteer corps has been formed, and the members have erected a large drill hall, and formed a rifle range and erected targets close to the North-West boundary of the town. The civilian rifle club also has an up-to-date range South-East of the town. Population: 1,050 males, 437 females; total, 1,487. At a distance of 58 miles East-North-East of Menzies is *Yerilla*, once an active mining centre.

Mertondale.—The progress of this townsite has been disappointing, owing to the tardy development of the leases in its

Digitized by Google

vicinity. It lies in a direct line 18 miles North from Malcolm, and is reached by a Government cleared road, 20 miles in length. One or two shops and an hotel are at the present time the only business places. The branch of the National Bank has just removed here from Malcolm. Coaches run from Malcolm on Mondays and Fridays.

MIDLAND JUNCTION is distant about two miles from Guildford and eleven from Perth. It forms the junction for several important lines of railway, and the Midland Railway Company have their workshops here. It is a municipality, with a population of 911 males and 657 females; total, 1,568. There are six hotels, a public hall, and a new railway station of considerable size, also a new post office and State school. There are already Anglican, Wesleyan, Congregational, and Presbyterian places of worship, and the Roman Catholic congregation contemplates building. Owing to the quality of the clay in the neighbourhood having been found suitable for the brickmaking industry, the kilns are both numerous and prosperous. In the vicinity, on the Darling Range, are situated the mills of the Canning Jarrah Company, which has a private railway to the "Junction"; also the *Greenmount* and other quarries, the *Darlington* wineries, and the small settlement, *Smith's Mill*.

MINGENEW is a settlement on the Midland Railway, about 40 miles East of Dongara. It is the centre of an extensive area of rich but as yet undeveloped agricultural land. There are two comfortable hotels there, also several stores. Population, 200.

MOOLAYELLA TINFIELD is 12 miles North-East of Marble Bar. It has a weekly mail service. A large quantity of stream tin has been obtained from this field. There are on the field one hotel, a boarding house, two stores, and a butcher's shop. Population 130, including fossickers.

MOORA, a small township on the Midland Railway about 100 miles North from Perth, is surrounded by some splendid agricultural country, some of which is at present annually producing heavy crops. It also forms the centre for cattle-trucking, and trade consequent thereon, for some of the finest squatting stations in the State. Population, 2[illegible]

MOORAMBINE is one of the oldest agricultural settlements in the Beverley district, six miles East from Beverley, and 136 miles South-East from Perth, near the Great Southern Railway line. There are, [illegible] amongst the public buildings a State school, an agricultural hall, and an Anglican Church. It also has its Roads Board. Population [illegible]

[illegible] 26 miles [illegible] by private [illegible] the Wellington [illegible] a Government [illegible] for the [illegible]

Mount Barker is a township on the Great Southern Railway, 38 miles from Albany and 302 miles from Perth. The district is noted for its rich fruit-growing lands, apples thriving particularly well. There are several large orchards close to the townsite. Being 800 feet above sea level, the climate and soil are well adapted for the growth of various grain crops and vegetables, the yield per acre being extremely good. The principal buildings include a church (Anglican), school, railway station and refreshment rooms, public hall, post and telegraph office, two hotels, and a police station. There is a daily train service from Albany and Perth. Population, 78.

Mount Magnet, situated about 50 miles South of Cue, on the Geraldton-Cue line, has some gold-bearing reefs in the vicinity, which are being worked. A municipal council controls the town affairs. Two courts are held, one by the Warden monthly, and a local one for the recovery of small debts. A Mining Registrar resides there. A plentiful supply of water is available for crushing and all other purposes. The public buildings comprise a Warden's and police court, a post and telegraph office (built of stone), a miners' institute, municipal chambers, and a public school. In the neighbourhood is *Boogardie* (Jones' Well), a mining camp situated about four miles West of the town, where, owing to rich discoveries, a number of leases have been taken up, and steady and satisfactory progress has been made. Population of Mount Magnet, 374, and of Boogardie, 86.

Mount Malcolm, a townsite in the Mount Margaret Goldfield, situated 140 miles North-North-East of Coolgardie, and 64 miles from Menzies (latitude 28° 56′, and longitude 121° 30′ East), is the headquarters of the Warden. Population: Males, 146; females, 104; total, 250. It has five hotels and a brewery. There is a branch of the Western Australian Bank here. The public buildings are the Warden's offices, survey office, post and telegraph offices, police quarters, and hospital. The local court is held the first Wednesday in each month. The town is connected by telegraph with Laverton, Mount Morgans, Murrin Murrin, Leonora, and Diorite King, all in the same goldfield. Good water in abundance is obtainable everywhere by sinking for it to moderate depths. There is a weekly newspaper published. The extension of the railway from Menzies to Leonora passes through the townsite. Towards the end of 1900 Mount Malcolm was proclaimed a municipality.

Mount Morgans is the principal town in the Mount Margaret District of the Mount Margaret Goldfield, and is, in fact, the most central town on that goldfield. The *Westralia Mt. Morgans*, the *Guest*, and the *Millionaire* mines adjoin its boundary on the East, and many very promising leases lie within a radius of four miles around it. A local court is held on the third Monday in each month. A municipality was proclaimed towards the end of 1900. Post and telegraph offices and police quarters and lockup have been provided, and there are four hotels and numerous shops in the

Digitized by Google

town. Branches of the National and W.A. Banks have been opened. A daily coach runs from Malcolm through this town to Laverton. Mount Morgans is distant by road, 39 miles, and lies 36 miles in a straight line East-North-East from Malcolm. Population, 503 males, and 140 females; total, 643.

MULLINE is situated about 32 miles East of Menzies, and around this centre there are many highly payable leases. A 20-head battery and cyanide plant has been erected by the Government, and has proved a great boon to the prospectors of this district. Mulline has a weekly mail service and a bi-weekly passenger coach service with Menzies, and is in telegraphic communication with Coolgardie. It has two hotels, a miners' institute, and a branch of the Union Bank of Australia.

MULWARRIE is a mining centre situated about 35 miles West-South-West of Menzies, and about five miles in a Northerly direction from Davyhurst. There are two hotels and post and telegraph offices. A mining registrar's office is shortly to be opened there. A Government battery is in course of erection.

MUNDARING has a population of about 250, chiefly wood-cutters and labourers. It is the station from which the line to the Mundaring Weir starts. The latter is distant about 5 miles in a South-East direction, and is the reservoir and catchment area for the Coolgardie Water Supply Scheme.

NANNINE, a mining township, is situated about 52 miles North-East of Cue, and will be the terminus of the Murchison railway as at present contemplated, the line from Cue to Nannine being now under construction. It has promising reefs, which are being steadily developed, and batteries have been erected for crushing purposes. A Warden's court, for the transaction of all mining business, sits once a month. Nannine has a mining registrar, and also a municipal council. Local court sessions are held regularly. The town has postal and telegraphic communication, and possesses four hotels and several stores. There are public buildings, a Roman Catholic church, public school, miners' institute, and hospital in the township. Good water is obtainable in abundance by sinking and from a Government well. There are several small mining centres around Nannine. The population of the municipality is 93, but that of the surrounding district is estimated at 600.

NANNOUP townsite is situated by rail 162 miles from Perth and 178 miles from Albany. The surrounding district is one of most fertile along the Great Southern Railway line, equally suitable for cereals and fruit-growing and stock-raising. The land is more undulating than in some of the other districts. Very little difficulty is experienced in obtaining fresh water, springs are plentiful. A large number of selectors from the Coolgardie goldfields and the Eastern States have recently settled in this district, and are making good progress. Population of district, 67.

Digitized by Google

Newcastle, or Toodyay, as the old townsite was called, is a small, prettily situated town, on the Avon River, about 50 miles East of Perth, at the terminus of a branch of the Eastern Railway. The surrounding country is principally devoted to the cultivation of cereals and raising of stock. The land is pronounced by experts, and has been proved to be, admirably adapted for the growth of vegetables, fruit, and wine. When the capabilities of the soil are more fully appreciated, there is every prospect of this locality becoming one of the chief centres of the wine industry of the State. Population of municipality:—167 males, and 172 females; total, 339. The town is steadily progressing, and the surrounding district is becoming famous for its splendid wheelwrighting timber, large quantities of which are exported annually. The district is also noted for its pastoral capabilities; a considerable quantity of fat stock is annually forwarded to the city and goldfields. The public buildings consist of a court-house, post office, and council chambers.

New Norcia is situate 48 miles North of Newcastle. At New Norcia a mission for the civilisation of the aborigines was founded in 1846 by the Spanish Benedictine Order of Monks, under His Lordship the late Bishop Rosendo Salvado, who died recently in Rome. Father Torres, who succeeded, as Superior, the late Bishop, intends to make further additions to the already extensive establishment. Here the aborigines and their descendants are taught, with very satisfactory results, to do all kinds of agricultural and other farm work for which they show great aptitude. The monks, besides horse-breeding and cattle and sheep-raising, grow sufficient wheat for their own consumption, and this they manufacture into flour on the premises. Fruits, fresh and dried, tobacco, and also olive oil, are produced in quantity. Close to the mission is a substantial courthouse, and also a post office. Population, 491.

Niagara, 30 miles North-East from Menzies, has a population of 1,099, and is a centre of much activity in gold-mining operations. It has a daily postal service, a daily train and telegraphic communication *viâ* Menzies. Water for crushing purposes is plentiful. A large reservoir, capable of holding forty million gallons, has been constructed three miles South of the township.

Norseman, the official and business centre of the Dundas Goldfield, is situated about 110 miles South of Coolgardie, and within 126 miles of the port of Esperance. Here the warden's, magistrate's, and local courts are held, and a number of Government buildings, including court-house and post office, have been erected. The Western Australian and Union Banks have business premises in the town. The township is situated within easy approach of the mines, and possesses a municipal council chamber, three churches, one hospital, five hotels, a brewery, and a number of general stores. The health of the township is exceptionally good. Condensed water is supplied to the town and to the mines from several plants. Population of the municipality, 155 males, and 108 females; total,

Digitized by Google

263 About 22 miles North-East of Norseman is *Buldania*. Other mining centres in the vicinity are *Lady Mary*, five miles to the South, with a weekly mail service, and *Peninsula*, about 20 miles North of Norseman.

NORTHAM is a township situated about 18 miles South of Newcastle, on the banks of the Avon river, and 66 miles from Perth, on the main Coolgardie line. Surrounded by a large tract of excellent arable land, which is principally devoted to the growth of cereals and fodder, and the raising of stock, it is the natural depôt for all produce or stock sent from the district to the Eastern Goldfields, and has therefore risen rapidly in importance since the opening of the railway, being now the scene of considerable commercial activity. The land in the neighbourhood, in addition to its value for farming pursuits, is well adapted to the growth of vegetables, fruit, and vines, and good progress is being made in their cultivation. Since the opening of the goldfields agriculture in the district has received a great impetus, and a large area is now under crop. Bacon-curing is also carried on to some extent. To cope with the increasing traffic, considerable changes have been made in the Northam railway station yard and buildings, works aggregating £25,832 in value having been completed. Recent additions to the hospital have made it one of the most complete in the State. Northam boasts of one of the finest town halls in Western Australia, partially completed at a cost of nearly £3,000, the seating accommodation being equal to most of the halls in Perth or Fremantle. The other public buildings comprise a commodious court-house, mechanics' institute, and free library, railway institute and reading room, post and telegraph office, two banks, four churches, temperance society's hall, and parish hall in connection with the Church of England. The town is lighted by electricity under a contract with the municipality. There is also a telephone exchange. The municipality is governed by a mayor and nine councillors, and has a revenue of nearly £[illegible]. Agricultural implements are manufactured on a large scale in the town, the various factories employing a large number of men. Population: 1,073 males, 945 females, total 2,018.

[illegible] is situated about [illegible] miles North of Geraldton. [illegible] Geraldton-Northampton railway, and one of the [illegible] in the State. There are [illegible] accommodation. [illegible] pastoral [illegible] Post [illegible]

[illegible]

Digitized by Google

the Fremantle Harbour Works was obtained. In this locality it is proposed to set aside 80 acres for a public park. The population is 1,796 males, 1,450 females; total, 3,246. Within the town limits are located timber yards and saw mills, a tannery and boot factory, steam laundries, and warehouses. Extensive wharves, docks, and other works in connection with the Fremantle Harbour Works are within the municipality, and a special loan has recently been raised for the building of a town hall and other improvements. There are in the town three churches, schools, a literary institute, branches of friendly societies, and four hotels.

NULLAGINE is 86 miles from Marble Bar. Population, about 76. It is an important centre in quartz and alluvial mining. There is here a large area of conglomerate carrying gold. In the past this was one of the most important alluvial fields in the State. Diamonds are said to have been found, but up to the present none of any great commercial value. There is a weekly mail service, and the district is connected with Marble Bar by a telegraph line. Considerable impetus has been given to gold-mining by the recent discovery of payable reefs and alluvial in the 40-Mile country. There are in the town two hotels, stores, etc. A warden's and local court are held the second Monday of each alternate month. There are three batteries, employing 30 stamps, at work near the town.

NYNGHAN is a mining centre 22 miles South of Field's Find A five-head battery is at present working with good results. The place has one hotel, and store.

ONSLOW is the principal port of the Ashburton district. The anchorage is an open roadstead exposed to the prevailing winds, and vessels calling at this port discharge their cargo into lighters. A tidal jetty has been constructed, and a tramway connects it with the town. Amongst the Government buildings are a residency, post office, custom house, court-house, and a Government hospital. Onslow is a rendezvous of the vessels employed in the pearl shell fishing industry on this coast. There is a large quantity of wool, sandalwood, pearl shells, pearls, and tortoise-shell exported yearly from this port; and recently also copper, lead, and silver ores from the mines at Uaroo. Population, 78. There is a fortnightly inland mail service from Onslow, communicating with the Ashburton goldfield and all stations *en route*.

PADDINGTON is a mining centre about two and a half miles South of Broad Arrow, on the Kalgoorlie-Menzies railway. Its population, including the mining camp of *Smithfield*, has largely increased in the past year, and at present numbers 331 persons. The town has five hotels, a police station, post office, miners' institute, and four batteries. It is a municipality, with a mayor and six councillors.

PAYNESVILLE is situated about 48 miles East of Mount Magnet, and both alluvial and reefs have been discovered here, and are being worked. The population of the place is about 135.

Digitized by Google

PEAK HILL, situated between the heads of the Gascoyne and Murchison Rivers, is 120 miles from Nannine by road *viâ* Abbott's. It has a bi-weekly mail, and communication is easy, as the water supply along the route is good. A telegraph line is constructed. In Peak Hill itself water is obtainable at a depth of about 250ft. The principal mines being worked here at present are on what is known as the "Patch." There is a 40-head battery connected by a tram line with the main shaft on the "Patch," and there are also cyanide works and a complete filter press plant nearly erected. There is a Government 10-head battery about 1½ miles North of the town, where a well gives an ample supply of good water. Peak Hill has proved wonderfully rich. Another promising centre is called the *Horseshoe*, which lies 16 miles to the North, and there are other outlying mines at *Mt. Fraser*, *Wilgeena*, and the *Pinnacles*. Peak Hill boasts a branch of the Bank of Australasia, a court-house, post office, and police station. Population, 205.

PERTH. For description *see* page 158.

PINGELLY is a small agricultural centre, situated by rail 130 miles from Perth and 210 miles from Albany. At the Eastward large areas of excellent land exist near Moorumbine and Wickepin, and on the Westward towards Staunton Springs and the Hotham River. Suitable land for settlement is still vacant in this district, where farming, fruit-growing, and stock-raising are successfully carried on by a large number of old and new selectors. Population, 168.

PINJARRA, 54 miles from Perth, situated on the Murray River, is the centre of an agricultural district of large area, about 50 by 60 miles. It is well watered by the river, and the district is capable of producing all kinds of cereals, vegetables, and fruits of both the temperate and tropical zone. The district has much good land, which is being rapidly taken up by an increasing population. The town is now well supplied with sawn timber from the neighbouring mills, an incentive to intending settlers, as hitherto building was very expensive. The climate is extremely healthy, and would support a large sanatorium, for which it is admirably adapted. Pinjarra is connected with the capital by railway, road, and telegraph. It has good hotel accommodation, and is a healthy and pretty resort, where fishing, shooting, and boating can be thoroughly enjoyed. Population, 389.

PORT DENISON is a small port at the mouth of the Irwin River, along which is a considerable extent of magnificent agricultural lands. It is connected with Dongara, two miles inland, by a good macadamised road, and a large amount of wool is annually exported from this place.

PORT HEDLAND, 100 miles from Marble Bar, has been declared a townsite. It is the only natural port for the Pilbara Goldfield, and most convenient for the shipment of live stock. The channel, which is six fathoms deep at low water, has been buoyed, a jetty constructed, and a causeway across the marsh

Digitized by Google

completed. There is a post office, with telegraphic communication with Roebourne and Marble Bar. There are three hotels at the port, a branch of the Union Bank, a police station, and several stores. Steamers call regularly on their trips up and down the coast. Population, 196.

PRINCESS ROYAL, a busy and important mining centre, is situated about five miles North-East of Norseman. A township has not yet been proclaimed here, but a number of residence and business areas have been laid out for occupation. There are two hotels and several general stores, and the sanitary conditions of the place are looked after by a local board of health. A large number of miners find employment on the mines in this locality. There is a mail service twice a week from Norseman. Population, 510.

QUELLINGTON is an old agricultural settlement in the York district. The chief buildings are a State school, agricultural hall, and post office. Population, 288.

RAVENSTHORPE is the chief town and centre of the Phillips River Goldfield. It is situated on hilly ground, about 25 miles North of Hopetoun, the port for the goldfield. Its principal buildings consist of a Warden's court, a post and telegraph office, a school, and a Baptist church. About 12 miles South-East areas have been surveyed at *Coondip* (late "Harbour View"). The water in the vicinity is brackish or salt; there are two Government condensers on the field, one situated about 1½ miles East from Ravensthorpe, and the other at Coondip. Owing, however, to the heavy rains during last winter, surface water has been abundant, and there has consequently been no necessity for using the Government condensers. The Floater Company (Gilbert Gold Mines, Ltd.) are constructing a pipe line, a distance of about three miles from their battery to the Annabell Creek, where a large supply of salt water is expected to be obtained by sinking. The country from Ravensthorpe to Carlinup is fairly timbered, and there are good patches of agricultural country in the district. The field is principally dependent on its gold and copper resources, more especially copper, and efforts are now being made for the erection of smelting works, as at present the cartage, freight, forwarding, and smelting charges on ore sent to Wallaroo in South Australia amount to about £8 per ton. No alluvial gold has yet been found. There is a weekly mail service from Albany by steamer, and coaches run between Ravensthorpe and Hopetoun twice a week. A hospital will shortly be erected at Ravensthorpe, and a doctor has recently arrived on the field. Population, 344. At *Hopetoun*, the port for the field, there is a post and telegraph office.

ROCKINGHAM, which is situated about 17 miles South of Fremantle, is the shipping port for the Jarrahdale Timber Company. It is connected by telegraph and road with Fremantle, and has a public school, a church, and an hotel.

ROEBOURNE, the chief town of the North-West District, is a municipality governed by a mayor and five councillors, and is the

Digitized by Google

seat of the Government Resident, also the centre of trade for the pastoral district surrounding it, and the principal distributing centre for the West Pilbara Goldfield. The town is situated at the foot of Mt. Welcome, near the Harding River, and is well laid out with wide streets and substantial public buildings, including post office, hospital, court-house, gaol, and Government residency. Population: males, 212; females, 100; total, 312, including coloured people. The hotel accommodation is good, and the town has the convenience of a branch of the Union Bank.

Rothesay is a mining centre in the Yalgoo goldfield. A 10-head battery is erected there.

Rottnest is an island, situated West by North half North about 12 miles from Fremantle. It is seven miles long in an East and West direction, and two and a half miles broad. Rottnest is at present a pilot establishment, and is also used as a native prison. The population is 104. The island is a natural sanatorium, and contains the summer residence of His Excellency the Governor. There are chains of salt lakes in it, which lakes are generally supposed to possess great medicinal properties. At present, however, they are only utilised for the manufacture of refined salt of the best quality, and the production of crude salt. This industry is in the hands of the Government. Agriculture is carried on. Wheat, barley, oats, rye, and vegetables of all descriptions are raised, sufficient to meet the demands of the island. The manufacture of lime of first-class quality has also been carried on for some time past. Excellent building stone can be furnished from the island. A large quantity of this stone was used in the building of the Perth Mint. Near the middle of the island is the new lighthouse, erected in 1896. The light is a revolving dioptric of the first order, and may be seen at a distance of 23 miles. On Bathurst Point, to the North of the island, a second lighthouse has been erected.

Seabrook is a farming centre four miles East of Northam, on the Yilgarn railway. A battery of [illegible] stampers, with [illegible] was erected [illegible] for the treatment of [illegible] gold [illegible] a great scarcity of water [illegible] purposes now [illegible] a battery [illegible] and sent [illegible]

[illegible]

[illegible]

Digitized by Google

SOUTHERN CROSS, the only inhabited townsite of the Yilgarn Goldfield, contains, including the mines, a population of 564, of which 351 are males and 213 females. The principal public buildings in the townsite consist of the court-house, post office, warden's quarters, a large miners' institute, and three churches, with a public hospital just outside the town; also a public school, built of stone. There are several hotels. Southern Cross was at one time the terminus of the railway to the Eastern goldfields, and is connected with Perth by telegraph and by a daily mail. In the neighbourhood are the following mining centres:—*Hope's Hill*, about four miles North of Southern Cross; *Parker's Range*, 40 miles South of Southern Cross. At *Greenmount*, about five miles South-West from Southern Cross, several mines are being worked with very fair prospects. *Fraser's* and *Lake Polaris* are portions of the Southern Cross township. There are two properties working in Southern Cross, Fraser's South and Fraser's South Extended. At *Mt. Jackson*, about 100 miles North of Southern Cross, two batteries are erected, and will shortly be at work. The water supply of Southern Cross is now chiefly derived from the New Zealand gully dam, the property of the municipality. There are now one express and one ordinary passenger train daily between Perth and this town.

SOUTH PERTH is a very popular suburb, and building has been going on apace lately. The district is increasing rapidly in importance. The population of the South Perth Roads Board District (now a municipality) was, on the 31st March, 1901, 796, being 398 males and 398 females. A number of new houses are being erected in various parts, especially towards the Mill Point end of the suburb. In the vicinity of Coode Street, to the jetty at the end of which a channel is now being dredged, the houses are also rapidly growing thicker. Since the opening of the charming Zoological Gardens, which necessitated the deepening of the river channel, to provide an easier means of access for the ferry service to and from the city, South Perth has grown, and is still growing, rapidly in popularity.

SUBIACO.—The town of Subiaco adjoins the Western boundary of the City of Perth. The lands of the municipality extend along the North-Western boundary of the King's Park for a distance of two miles. Ornamental public gardens are established, also a municipal bowling green. An electric tramway traverses two of the principal streets for a distance of one and a-half miles. Subiaco has 900 dwellings, five churches, of the following denominations:—Church of England, Wesleyan, Presbyterian, Church of Christ, and Roman Catholic. The following public buildings are established:—Boys' and Girls' Industrial School, post office, public school, railway station, police station, and council chambers. The capital value of the municipality is £250,000, the annual value £29,000. Its indebtedness is £10,000. Population, 3,004, namely, 1,514 males, and 1,490 females.

TAMMIN is an agricultural centre on the Yilgarn railway, East of Northam. It has a Government school.

Digitized by Google

TOODYAY, *see* Newcastle.

TUCKANARRA is a mining township, situated about 24 miles North-East of Cue, and about 27 miles South-West of Nannine. Development work is going on, and the Government have erected a public battery, but it is not being taken advantage of as it should be. The earthworks for the Cue-Nannine railway have been completed to here. Population, 258.

UAROO is the recently-declared headquarters for the Ashburton goldfield. It lies 80 miles South by East of Onslow, in the Ashburton magisterial district. The specific minerals mined for are copper and galena. There is a fortnightly mail service from Onslow.

VICTORIA PARK.—A suburb situated on the East side of Perth, within two miles of the General Post Office. Since its proclamation as a municipality, many and varied improvements have been made. The town had, at the time of the 1901 Census, a population of 1,267, of whom 674 were males. The control of the Perth Causeway is vested in the municipal council.

WADGINGARRA lies about 13 miles from Yalgoo. This centre has recently been brought into prominence owing to the very rich gold returns—up to 14ozs. to the ton, crushed and smelted. In the neighbourhood is an extinct volcano.

WAGIN, on the Great Southern Railway, situate by rail about 147 miles from Albany and 193 miles from Perth, has made rapid strides of late. A large quantity of land in this important district is now occupied for agricultural purposes, both East and West of the Great Southern railway line. In the vicinity large areas of rich land are to be found. The Arthur River, with its tributaries, provides a permanent water supply. Valuable improvements are being made by the settlers in the district. Population of district, 708.

WAIGERUP is a townsite situated 37 miles from Bunbury, on the South-Western railway line. It has a railway station, a Government school and an agricultural hall for the use of the population in the neighbourhood, but no business places.

WAROONA.—This place, which is contiguous to Drakesbrook, is the station for both places, and it is the centre of a large saw-milling population. There are three hotels and several boarding houses. The place is rapidly extending, almost all the good land having been taken up. There is also a well-attended State school. Population, 432.

WARRAWOONA is situated 18 miles South of Marble Bar, in the Salgash Range. It has a weekly mail service, and is connected with Perth by telegraph. It is an important quartz mining centre. Some of the mines have turned out some very rich crushings, notably the *Gauntlet*, the *Klondyke*, and *Klondyke Boulder*. There are two batteries, employing 20 stamps. The town has one hotel and stores.

Digitized by Google

WATERLOO is a village situated seven miles from Bunbury, on the Perth-Bunbury railway. It has a railway station, goods shed, agricultural hall, and a Government school for the use of the children of the surrounding settlers.

WATEROUS is an isolated sawmill, belonging to Millar Brothers, reached on their tram system from Yarloop, on the South-Western Railway. It is about 10 miles from the latter place, prettily situated in the ranges on a running stream. There is a Government school, which is well attended, and there are Anglican church services regularly conducted in the school every month. Population, 307.

WHIM CREEK, situated about 53 miles East from Roebourne, is a mining centre. From the Whim Well Copper Mine something like 2,000 tons of Copper Ore have been shipped to South Australia and Cardiff for treatment, yielding a very substantial profit. Within four miles from Whim Creek is situated the Mons Cupri Copper Mines. Smelters have lately been erected on this mine. There are two hotels here. Population, 214.

WILLIAMS RIVER is a small township on the old Perth-Albany road. It is 100 miles from Perth and 19 from Narrogin, on the Great Southern Railway. It is the centre of the Williams magisterial district, and contains a Government hospital, a school, a post and money order office, a court-house, and a police station. The town is surrounded by thousands of acres of good agricultural and pastoral land, much of which is, unfortunately, held by absentees. Population, 112. Other small adjacent centres are *Marradong*, *Wandering*, and *Quindanning*.

WILUNA (Lake Way), situated 120 miles North of Lawlers, was proclaimed a township in 1897. It is the centre of a rich auriferous belt. Public buildings:—Post office, miners' institute, Government school, Union Bank, and hospital. There are three hotels, general stores, shops, etc., in the town. Population, 301.

WONGAMINE is a farming settlement, situate about 12 miles North-East of Newcastle. It has its agricultural hall and public school. The soil in this neighbourhood is first class, with a fair rainfall, and is in every way adapted to the growth of cereals and stock raising.

WOODARRA (Lake Darlôt) is 50 miles East of Lawlers. It was declared a townsite in 1898. It has two hotels and two stores. A Government public battery of ten stamps has been erected about three miles from the town. Population, 129.

WYNDHAM, East longitude 128° 5′, South latitude 15° 27′, is situated on the East shore of Cambridge Gulf, 45 miles South from its entrance to the Indian Ocean. It is the business centre of the whole East Kimberley district, the North-East terminus of the Western Australian system of telegraphs, and is connected with Fremantle and the intermediate coastal ports by one of the Adelaide

Digitized by Google

Company's steamers running once in every eight weeks, and with Fremantle direct once a month, from March to December, by a locally-chartered line of cattle boats. Also connected by steamer with Port Darwin. The arrangements for shipping cattle are very complete. The public buildings consist of a magistrate's residence, hospital, gaol and gaoler's quarters, post and telegraph office, police quarters and station, goods shed and bond, and a mechanics' institute with a good library. The population numbers 68. There is a small settlement three miles from Wyndham, called "The 3-Mile," consisting of a public house, blacksmith's shop, saddler's shop, and a slaughter yard, and also possessing a Government well.

YALGOO is the principal town of the Yalgoo Goldfield, and is situated about 138 miles East North-East of Geraldton. At present the warden from Cue visits Yalgoo on the second Thursday in each month. Yalgoo contains a population numbering 182. The local court of the Yalgoo Magisterial District is held monthly. The town contains a warden's office, court-house, post and telegraph office, police station, Government school, a fine roomy miners' institute—the largest on the Central Goldfields—a Wesleyan Church, five hotels, railway refreshment rooms, together with a number of stores and a substantial hospital. At present the hospital is closed on account of no sickness being prevalent. Good water is easily obtained at about 30 feet. The squatting industry is very largely carried on in the neighbourhood, the principal sheep stations on the Murchison being in the Yalgoo district. Yalgoo has a daily mail service (by rail) with Perth and Geraldton. The outlying centres are now coming to the front, notably *Field's Find*, *Nynghan*, and *Wadgingarra*. Quite recently the township, which has been somewhat dull, has taken a new lease of life. The *Emerald Mine*, which about four years ago yielded upwards of £10,000 worth of gold from small surface workings, is now crushing stone worth about 1oz. to the ton, and the proprietors are developing rapidly, and are very hopeful of picking up the rich chute of stone previously worked. The sandalwood industry has been very lively for some months past.

YARTOOR is a timber station situated on the South-West line, 36 miles from Bunbury. It is at present closed down. Public buildings: Railway station, police station, post and telegraph office. Private buildings (the property of the company): A hospital, also a hall and library for use of employees. In addition there are an hotel and two stores. Population, 331.

YARRAGOO is a rural settlement about 8[illegible] miles West from Meeka, on the Midland Railway. The place is well known for its fine stock-raising capabilities, whilst its butter never fails to command a high price. It is also noted for its adaptability to fruit and wine growing. The roads in the neighbourhood are excellent. The soil and the rainfall are such that [illegible] desired. Population, 264.

YARRI[illegible] or MURCH[illegible]

York, at the present time the largest agricultural centre of the State, is situated on the Avon River, about 60 miles East from Perth, and the Perth to Albany railway passes through the town. The district includes the Dale and Mackie Rivers' basins, and part of the Avon, their valleys being very fertile, the soil being specially adapted for the growth of cereals, potatoes, vines, and fruit trees. Oranges do well in many parts of the district. The high price realised for hay and cereals, owing to the demand from the goldfields, has proved an incentive to the people of the district, and large tracts of land are being rapidly brought under cultivation. The town is one of the most picturesque in Western Australia, and is particularly healthy. Population: Males, 673; females, 689; total, 1,362. Branches of the Western Australian Bank and the Union Bank carry on business. The line of railway connecting York with Greenhills, which is now completed, is 14 miles long. It serves the settlers of the good agricultural land at Greenhills, and affords them better and cheaper facilities for bringing their produce to market. York now contains a very fine court-house, post office, hospital, municipal council chambers, two fine roller flour-mills, a bacon-curing establishment, a large tannery, several hotels, and numerous mercantile institutions. Two large bridges span the River Avon within the municipality.

Yuin, about 60 miles North of Yalgoo, has one hotel and store. A five-head battery has lately been erected, and the opening of a school is contemplated shortly. Upwards of £10,000 worth of gold has been taken from this centre.

Yundamindera (The Granites) is a mining town 40 miles North-East of Kookynie, and is the centre of a rapidly-improving district. It has three hotels, a post and telegraph office, and a branch of the W.A. Bank. There is one battery (10 head of stamps), which is supplied with water from the mine. Water for domestic purposes is obtained from fresh water wells in the neighbourhood.

Digitized by Google

6.—ABORIGINES OF WESTERN AUSTRALIA.

Under this heading it is proposed to give a brief and succinct account of the Aborigines of this State as regards—

(1.) Their Origin and Language.
(2.) Their Physical and Mental Characteristics.
(3.) Their Social Condition and Domestic Habits.
(4.) Their Laws and Treatment of Criminals.
(5.) Their Marriage and Inheritance System.
(6.) Their Superstitions and Peculiar Customs.
Adding (7.) Some Miscellaneous Information.

(1.)—Origin and Language.

On account of the divergence of opinion exhibited by the most celebrated authorities as to the origin of the Australian aborigines, the only method of presenting an acceptable statement regarding it is to note briefly the most rational and best known of the views held by men capable of dealing with this subject.

Sir George Grey, than whom no man is more fitted to speak with authority on the question, decided that, no matter what the apparent differences between tribes in the various districts of the Colony might be, their common origin and fundamental unity must be admitted, giving the facts which supported his decision as follow:—

(*a.*) A general similarity in the sound and structure of words used in different parts of Australia.

(*b.*) The recurrence of the same word with the same signification in many instances round the entire Continent, subject only to unimportant modifications.

(*c.*) The frequent occurrence of the same names of natives at totally opposite portions of the colonies, and the fact of children being named from any remarkable circumstances attendant on their birth; an accordance of the names of the natives being a proof of similarity of dialect.

Objections to the accuracy of the second statement are explained by noting that synonyms are common, and that these are given instead of the original words to travellers who ask the names of certain objects.

The Albany natives use words similar to those of Perth, with the differences (1) That their words are shortened to monosyllables, (2) That all verbs have the ending "gar," and not various terminations, as in the Perth dialect, which fact exemplifies statement (b).

To this important enunciation some support is given by all ethnologists, but it is generally regarded as a fact that the essential characteristics of the race have been greatly influenced by the influx, from time to time, of aliens who have landed on these shores. As

Digitized by Google

to the ethnological division to which the original race belonged, Grey makes no definite statement, but others have asserted, in more or less decisive terms, their opinions on the subject. Says one well-known ethnographer, when alluding to the aborigines: "Their physical features, no less than their mental condition, forbid us to associate these people with the inhabitants of any other surrounding country. They are entirely separated from the Papuans of New Guinea by their silky hair, ample beard, and contrasted features—no less than by their ignorance of the bow-and-arrow, the chief weapon of most of the Papuan tribes. Still further removed are they from the Malays and Polynesians; so we are driven to suppose that they are the remnant of an ancient and peculiar race . . . . We must, therefore, believe that the Australians represent a primitive family which has been superseded in other countries by somewhat higher tribes. It is now generally admitted that the only other people with whom the Australian aborigines can be associated are some of the hill-tribes of Central India, with whom, not only in their physical features, but to some extent in their languages, they correspond. The Papuans may have formed a second great wave of immigration."

A very plausible theory is brought forward by Curr, who, from a comparison of the customs, dialects, etc., obtaining in Africa and Australia, declares that the peoples of the latter Continent are by descent Negroes crossed with some other race, differing only as they do in physical characteristics. The modifications of type found in the North he assigns to the connection with the Malays engaged in the trepang fishery.

Another authority contends that, though some indications would point to African ancestors, the Australians belong to neither the Negroid nor Mongoloid types, while in many respects they must be looked on as Caucasians, like the Ainos of Japan, Chams of Cambodia, and other Asiatic races possessing a Caucasian affinity; with the difference that they are far lower in the scale of humanity than all these latter races.

The great difficulty in tracing back the descent of this race arises from the facts that they have no written language or records, and that etiquette forbids any allusion to the dead. The spoken language of the aborigines, cut off as they have been in a marked manner for so many centuries from the other inhabitants of the world, probably presents less divergence from its original than that of any other race. This accidental advantage helps in a marked degree, and is made use of largely, as we have seen, by those who attempt to solve the mystery surrounding their common origin. But there are some authorities who would point to the cave-drawings or paintings found in different parts of the State as proofs of their several theories, and these remarkable antiquities now claim attention. These productions of an ancient race are usually found in the coastal districts—sufficient examples existing, however, to show that this rule is not absolute. Thus, in 1830, Ensign R. Dale, while exploring in the York district, found a sandstone cave,

Digitized by Google

on one side of which was rudely carved a representation of the sun, "a circular figure eighteen inches in diameter, emitting rays from its left side," and close to this were impressions of an arm and several hands.

On the 21st September, 1854, Mr. Robert Austin found singular carvings (representations of human hands and the feet of different animals) within a quartzite cave in the Murchison district. They were very well executed, and of a type decidedly superior to some clumsy imitations of a more recent date in the same cave.

In 1891 rude drawings were seen on a rock face in Central Australia by Mr. David Lindsay.

In 1896 Mr. Wells reported the discovery of cave-drawings to the South of the Tropic of Capricorn, some 500 miles inland from the coast.

But the most important discoveries—those of Grey, Flinders, and A. Cunningham—were made on the seaboard of the Northern coast.

The former's finds, on the 27th March, 1837, and subsequent dates, in the valley of the Glenelg, were situated about 60 miles inland and 20 miles South of Prince Regent's River.

At the entrance of the first cave a "most extraordinary large figure" was seen peering down upon him, and paintings of a man and several women were on the walls and roof of the interior. Superior artistic instinct was shown by the rock being painted black, so as to introduce with greater effect the red and white of the pictures. Hands, heads, an ellipse, and other objects were subsequently found; but perhaps the most remarkable discovery was that of the profile of a human face and head cut out in a sandstone rock, which carving bore undoubted signs of antiquity. In one instance curious characters were displayed, and altogether five colours—red, yellow, blue, black, and white—were used in the paintings. Grey also found near the coast several tumuli or barrows.

Mr. Chief Inspecting Surveyor F. S. Brockman, in his report on the exploration of North-West Kimberley, made by him in 1901, makes the following reference to the cave paintings:—

"A remarkable custom of the aborigines of the Western part of the district South from Admiralty Gulf is that of painting representations of the human figure, beasts, reptiles, etc., on almost every available smooth, vertical face to be found in the sandstone ranges. Over the area in which these paintings occur, I frequently found the pigments used at the native camps, and invariably have found them in every bundle of household goods abandoned by the natives on our approach. These pigments consist of several colours of oxide of iron, pipeclay, and ground charcoal."

Digitized by Google

Dr. F. M. House, who accompanied the expedition as Naturalist and Botanist, says :—

"The most interesting thing connected with these natives, or rather with a certain section of them, is the custom they have of making drawings on suitable faces of rock. The first specimen of these which we met with was near Camp F.B. 25, and consisted of a row of figures. The place was one which had been used evidently for a great number of years for depositing the bones of the dead. The figures are clothed, and all in a similar style of garment, with what appears like a necktie just below the throat. Curiously, this same style of figure, similarly dressed, occurred wherever paintings of any extent were found. In all there is an absence of the mouth, and what appears to be a halo round the head. These figures agree in these particulars with those found by Grey, on the Glenelg, in 1837. The colours used are red, yellow, black, and white, the black being charcoal, and the other colours argillaceous earth, specimens of which we found carefully wrapped up in paper bark parcels in most of the camps which had been vacated hurriedly owing to our approach. The drawings are finished with greater care and attention to detail than one would expect to find in such a primitive race, and they apparently value them considerably, choosing places, as far as possible, where they will not be injured by the weather. In all the more elaborate drawings the colours appeared to have been simply mixed with water, and could be smudged by rubbing with the finger, but in one or two places on the Glenelg I saw smaller drawings and marks in red which were made with some other pigment, and were not affected even by wet. In the other drawings the snakes appear to be devouring human beings, and in one drawing eggs are shown inside the snake. The origin of these figures affords an interesting field for speculation and investigation. That they date back before the advent of the first known white men we know from the discoveries of Grey, but evidently they must have seen men with clothes at an earlier date, possibly shipwrecked mariners, or Malays who used to come across to the coast to get bêche-de-mer. It is probable that they copied their first drawings from some done by white men, and the result being pleasing to them the art was handed on; that they should adhere so closely to one design shows either a great lack of originality or that they attach great importance to that particular figure. From the extent of the area over which these drawings occur I should imagine they are not peculiar to one tribe. We found none South of the Charnley River, and how far North they extend I do not know; but beside those near F.B. 25, others were found near F.B. 49, C9, and C25. Near C9 was found a single figure of the same design depicted on a piece of basalt and deposited in a native hut which had recently been burnt."

These silent witnesses all point to the presence, at some early date, in this State, especially its Northern portion, of a race superior to that found at the present time. The existence of individuals of a lighter complexion and with more regular features

Digitized by Google

than usual, noticed by several travellers—notably Grey, Giles, and Stokes—is, perhaps, confirmatory of such an idea, and some writers have laid great stress on this circumstance.

The native language is derived, according to some authorities, from the Malayan. The emphasis is usually on the penultimate, and the structure is flexible; otherwise, the aborigines could not repeat with facility the words and sentences of the settlers. No provision is made for the expression of abstract conceptions, nor for reckoning up further than three, and although there is no written language, yet the natives use a cypher, employing a nicked or burnt stick as the medium of communication. The hunting cries are wild and strange, and have a peculiar distinctness of sound, commencing, as they do, with hard consonants, as the "K" in "Kau" and "Kooee." The dialects of the North-West natives are more melodious than those of the Southern, but this is only one of many differences noticeable between them, and consequent upon those varieties of climate and food necessarily found in a country extending from 13° 34′ to 35° 13′ S. lat., and having an area of nearly a million square miles.

In a paper read at the Australasian Science Congress, Mr. A. W. Howitt, F.G.S., contended that the original occupation of Austral lands did not occur in a migration by water, by means of ocean-going ships, but any immigrants who reached this Southern Continent must have crossed either by a land bridge of islands connecting Asia to Australia, or over some shallow channels at that time intervening between the two Continents, and navigable for the crude means of conveyance possessed by these peoples.

With reference to the homogeneity between the Australian aboriginal dialects, Mr. Montague Miller, of Perth, who lived in the country districts of Victoria as early as the first half of the 19th century, relates that, on a visit recently paid to Coolgardie, he discovered that the aborigines he met there were well acquainted with several terms he had learnt as a child from some of the now extinct tribes of the older State. Such were the exclamation *wah* ("hallo!"), and the words *mannum* ("ride"), *borac* ("no" or "not"), *bungallally* ("stupid"), *merrigig* ("very good"), *quamby* ("settle"), *mia mia* ("hut").

(2.)—Physical and Mental Characteristics.

Upon the whole, the Australian aboriginal falls little short of the average European in height, though far inferior to him in muscular development, the limbs being thin and excessively lean, combined sometimes with an abnormal corpulence. The bodies are delicately formed, and there is the usual total absence of calves to the legs, so characteristic of the dark races generally. The cranial formation, somewhat finer in the male than in the female sex, is, on the whole, narrow and lengthy, with high cheek-bones, the lower portion of the forehead about the brows projecting, the upper receding rapidly. The nose, narrow above, thereby causing the eyes to appear drawn together, becomes broader and somewhat squat

Digitized by Google

further down. The ears are inclined a little forward, the mouth is large and unshapely, while the teeth are, on the contrary, fine and white, the upper row, like the upper lip, mostly overlapping the lower. The jaw-bone is contracted, the chin small, and the complexion oftener coffee-brown than actually black. The pitch-black hair is somewhat curly, without, however, being woolly, and, when cleaned from the mass of grease and dirt that usually clogs it, is fine and glossy.

The duration of life rarely exceeds 50 years. These particulars regarding the physique and appearance of the natives of this Continent, taken from the description by Mr. Wallace, apply, in the main, to the aboriginal tribes inhabiting Western Australia. The average height and girth of 50 aboriginals measured at Rottnest Prison, where natives from all parts of the State are confined, were found to be 65¼ and 33¼ inches respectively.

Their intelligence and reflective faculties are, as a general rule, of a mean order, but surprising quickness of apprehension, a keen sense of the ridiculous, and a great talent for mimicry have been often exhibited by aboriginals, and make them, in many instances, very good companions. Their females have been taught womanly accomplishments, and their men have learned and practised successfully mechanical trades; while in the Roman Catholic Mission at New Norcia, founded by the Right Reverend Bishop Salvado, they have proved good gardeners and agriculturists. Their perceptive faculties are very acute, and make them invaluable as trackers; and as messengers, pearl-divers, shepherds, horse-breakers, stock-drivers, hunters, or at any employment requiring only light manual labour, they have proved satisfactory and trustworthy. Nor, when instancing the use of aboriginals to the white man, must Tommy Windich, Tommy Pierre, and other natives who accompanied the early colonial explorers in some of their most arduous journeys, and proved almost indispensable, be forgotten. Those people who, like Dampier, declare the West Australian natives to be the "miserablest people on the earth," forget such proofs of manufacturing skill as are displayed in the spinning of the waist-girdle from the fur of the opossum or the human hair; but, on the other hand, it must be acknowledged that their primitive methods of calculation, such as that by tally-sticks or moons in the case of time, show them to be low in the scale of civilisation. The best method to pursue, when speaking of their mental powers, is to preserve a happy mean, and to remember, as Englishmen, Cicero's advice to his wealthy friend in Athens: "Do not obtain your slaves from Britain, because they are so stupid and utterly incapable of being taught that they are not fit to form a part of the household of Atticus."

(3.)—Social Condition and Domestic Habits.

The social conditions of each tribe are governed by their food supply and the facilities or difficulties of intercourse. Aboriginals are conservative in their habits, refusing, for instance, to imitate the European methods of preparing food by boiling or stewing.

Digitized by Google

The tribes, with few exceptions, are essentially nomads, having neither local habitations nor places of refuge, but roving only within the boundaries of that particular district, of the many into which the State is divided, occupied by them according to usage. In this they differ from other peoples of migratory habits, and still more in the fact that the time of visiting particular portions of their territory is generally regulated, so that their visit to that place occurs when the particular article of food for which it is noted will be plentiful or in season.

A curious custom, not peculiar to the Australian race, is that of the kobong or totem, by which that particular species of the animal or vegetable kingdom which is the distinguishing badge of a particular tribe is forbidden to the tribe as an article of food. Again, certain foods are prohibited to youths till they attain a certain age; but this custom does not seem to be connected with the taboo system mentioned above, and arises merely from utilitarian motives.

Food is obtained by hunting, fishing, or digging, and the supply is as a rule by no means scanty, as some travellers would have us believe, for in a far from exhaustive list prepared by Sir George Grey, from personal observation of different tribes which came under his notice, there occur the names of about 150 articles of food (including the different species of animals, fish, reptiles, roots, etc.) mentioned.

Nor, although slow in adopting the methods of aliens, is the Australian's way of preparing his food stereotyped or unsatisfactory. Though rude appliances are used, generally palatable and often really nice dishes are furnished. Thus, some tribes prepare fish for cooking by wrapping it in strips of a species of bark with a peculiarly-flavoured juice, which exudes in the process of cooking, and being preserved by the wrappings, gives the fish a flavour that would satisfy the most capricious gourmet.

In the matter of housing they are less particular, and their dwellings are of the most primitive description, taking, generally, the form of a breakwind composed of a few logs or thick branches covered with boughs or clay. In the North-West the natives sleep in the open, and their fire forms the only camp they make. Little clothing is required in the case of the aboriginals, and beside the girdle of yarn (noolban), the only garment used is the booka, a cloak made from kangaroo skins.

Their ornaments are few, the skin of a wild-dog's tail worn across the upper part of the forehead, and a tuft of emu's or cockatoo's feathers tied round the arm or fastened in the hair, being the most fashionable, while occasionally fur necklaces have been noticed by travellers.

By inserting bones in the septum of the nose, and scarifying the breast and other parts, the face or figure, from a native point of view, is improved; while a kind of red ochre (whilgey) is used for colour ornamentation.

Digitized by Google

The women are very scantily clothed, their bookas being smaller than those of the men. Amongst other *impedimenta* they carry the coota, or bag used when travelling for holding children, food, or other burdens, the grubbing-stick, or wanna, used for digging roots, and the lighted fire-stick of Banksia or Casuarina, which burns like touchwood, while in parts of the State the heart of the Xanthorrhœa, or grass tree, is used.

The aborigines display great cunning, perseverance, and agility in tracking, following, and hunting game, furnished with such simple weapons as they possess, and have three different ways of hunting the kangaroo, as they have also three different ways of preparing its flesh when killed. Although rude, their hunting appliances are admirably adapted for the purposes to which they are put; the principal weapons being the boomerang (kyley), hatchet (kodjia), knife (dabba), spear (gidjey), mero or wanner (throwing-stick or board), and dowak (club). The different parts of their weapons are fastened with pirin (a kind of cement consisting of blackboy gum and charcoal), and their fishing nets are ingeniously made from the triodia or spinifex plant. The first-named weapon, the kyley, is so constructed that, unless interfered with, it will assume a retrograde or lateral motion at the will of the person by whom it is thrown. This missile is not unique, as some imagine, a weapon almost similar to it having been used for hundreds of years in Abyssinia, and earlier still in ancient Egypt. According to Mr. B. Smyth, however, it is doubtful whether the Egyptian weapon had the power of returning, like most of those made by the Australians. Most of the hunting weapons already mentioned are, with slight alterations, also used in war; but in addition, the wondah, a wooden shield made of cork-wood, with an inward curve at the ends, and used for purposes of defence, is occasionally carried.

Tribes obtain by barter products which their own district does not supply, *e.g.*, the Watchandies, of the Murchison district, Western Australia, buy a particular kind of fishing-net, shells for drinking vessels, and a much-esteemed flint from the North; boomerangs, shields, and red ochre from the South; and a kind of pipeclay, used as mourning pigment, from the East. In return they supply the Northern tribes with the Xanthorrhœa gum, to the Southern men they give the beautiful rose-coloured crests of the cockatoo, and to the Eastern men flints.

The chief amusements of the natives are spear-throwing, dancing, singing, story-telling, and adorning themselves with paint, grease, and feathers—this last being almost wholly confined to the men.

(4.)—Laws and Treatment of Criminals.

It has been truly said that man in a savage state is supposed to be endowed with an absolute individual freedom, whereas, in reality, he is subject to a complete system of laws which not only enslave thought, but allow no scope for intellectual or moral

Digitized by Google

development. Such are the traditional regulations which keep the Western Australian natives in a condition of barbarism, and cause them to violate many of the most sacred usages of life.

Speaking generally, the tone of these traditions is decidedly in favour of the stronger and more influential members of the community, the older, to the detriment of the younger, in favour of the man rather than the woman.

Whether these laws are suited to the conditions of uncivilised life is an open question, but one of the most remarkable points about them is their general acceptance by the people whom they affect, and the ready submission to the penalties inflicted in accordance with their provisions. An instance, mentioned by the Rev. C. G. Nicolay, exemplifies this: Two young persons, in the Victoria district, who were enamoured of one another, were content to suffer severe punishment three times repeated, in order that, the law being satisfied, they might afterwards live together.

With regard to what may be termed "forest laws," the penalties are severe.

It has already been stated that each tribe has a particular district defined by well-known and recognised boundaries; but, furthermore, in some cases, each tribe's district is subdivided, and each male's family has a particular section (booja) preserved, the different sections carrying hunting privileges within their boundaries, and no stranger, except by invitation, has the right to enter such sections. "Poachers" in this respect are invariably punished —often by death.

Stringent laws for the preservation of food are absolutely necessary and are rigidly enforced.

Thus, no vegetable products used by the natives as food are plucked or gathered when bearing seed, and, as mentioned elsewhere, certain classes of natives are forbidden particular articles of food.

The first great principle in connection with punishment is based on the *lex talionis*, subject to the modification that the relatives of a culprit are implicated in his guilt.

As a general rule, when a man is killed, the duty of avenging his death, whether it be caused accidentally or not, devolves upon his nearest relative, who is disgraced and disowned if, through mercy or cowardice, he fails to enforce the law's demands. A *vendetta* is established; but, if it be found impossible to compass the death of the actual culprit, the sacrifice of some member of the latter's family—even a child—will answer the purpose equally well.

This explains to a great extent the murder of innocent settlers, who have often suffered vicariously for their predecessors' misdoings.

Seduction, incest, and adultery are nominally punishable by death, but are frequently regarded as only calling for a lesser penalty.

Digitized by Google

The most common form of punishment less than death, as used for minor offences, is the spearing of the offender through different parts of the body, preferably the leg or thigh.

As an instance of the law's inequality of burden, it may be mentioned that unfaithfulness on the part of a wife is not only visited upon her, but also frequently upon the wife of the man who has caused the trouble. Thus the two husbands escape, and the women, innocent and guilty, are indiscriminately punished.

On the other hand, a desire for fairness is shown by the regulation that should an animal be speared by two persons, it is given to him who threw his spear first.

(5.)—Marriage and Inheritance System.

The laws relating to marriage and inheritance amongst the West Australian aboriginals deserve separate consideration, being almost unique when compared with those obtaining in other parts of the world.

As has been mentioned, the natives are divided into tribes with families distinct in themselves; but this arrangement is to a certain extent temporary and dependent on the life of the chief or head man. What is meant by this will be more clearly explained by examining the two fundamental axioms enunciated by Grey.

Children of either sex take the clan or family name of the mother, and

A man and his wife cannot be of the same clan (but the system of intermarriages varies in different districts).

Examining the second statement first, the following is a tabular arrangement of relationship in six families about New Norcia (drawn up by Bishop Salvado):—

6, 3, 2, & 4, 5, 1	1 Tirarop	...	2 N-ocognok	3, 1, 4, 5. 2, 6.
1, 5, 2, 4, & 6, 3	3 Palarop	.	4 Tondorop	6, 3, 2, 5. 4, 1.
3, 1, 6, 2 1, 5	5 Mondorop	...	6 Jiragiok	5, 1, 4. 3, 2, 6.

The upper lines of bracketed figures show the families to which intermarriage is permitted, the lower those to which it is forbidden.

[According to Sir John Forrest, the marriage laws among the natives of the North-West coast are different from the foregoing. The aboriginals are divided into four families, the names of which are Boorunggnoo, Banigher, Kimera, and Paljarie. The first two can intermarry, and the last two also, but no other alliance is possible; for instance, if you meet a Boorunggnoo man, his wife must be of the Banigher family. The children do not, however, follow the father's or the mother's family, and those of such a union as has been instanced would take the name of Kimera; whereas if the name of the husband were Banigher, and of the wife Boorunggnoo, the offspring would be called Paljarie.]

Digitized by Google

The system of inheritance follows that of names and is strictly maternal. Thus it follows that, amongst the tribes first mentioned the possession of certain districts must be handed over from one family to another every succeeding generation.

Although the child belongs to the family of its mother, yet it belongs to the father's tribe, and he has consequently the right to decide whether it, when born, shall live or die.

The crime of infanticide is common, and Grey found that 41 females, whose cases were noticed by him, had only 188 children living. The practice may be attributed to the fact that, in some cases, the population of a particular hunting ground is too large in comparison with the supply of food obtainable in that district; consequently, some action has to be taken to check the increase. The female children are almost invariably assigned at birth, or when very young, to some particular man, who is generally one of the older ones.

Thus these men have, usually, a plurality of wives, and this system entails a disparity between the number of marriageable males and females; whilst the younger men, even if successful in obtaining prospective brides, have ten or more years to wait till the girls can become their wives.

For these reasons the crime of seduction is a very common one, and indirectly leads to many of the murders and tribal troubles which are constantly disturbing the peace of the community. The levirate law, by which, at a man's death, his wives are passed on to his brother, also helps to foment trouble and cause dissatisfaction.

The marriage ceremony simply consists in taking the bride to her husband's hut, which she then prepares or, in some cases, makes a new one, for his reception. After this simple ceremony the bride becomes her husband's property so absolutely that he may hereafter barter, exchange, or mortgage her at his pleasure.

(6.)—Superstitions and Peculiar Customs.

No people are more slaves to ceremony than the natives of Western Australia; in fact, for almost every daily occurrence of life a corresponding form exists.

The superstitious ceremonies accompanying death and burial are especially worthy of note, and the following features seem to be common to several descriptions furnished from different parts of the State of the forms observed there on such occasions.

At the time of death, professional female mourners are introduced, and the women relatives and friends of the deceased exhibit their grief by gashing the flesh on their cheeks and foreheads, and covering their heads and breasts with a kind of white pipeclay; whilst the men put powdered charcoal on their foreheads. A curious custom, somewhat similar to that prevalent at the present time amongst the Bedouins, existed, when the deceased's hut was torn up immediately after his death.

Digitized by Google

The funeral obsequies are performed to the accompaniment of dirges and lamentations.

A shallow grave, about four feet by three, having been dug, a bed of leaves is placed at the bottom, and the body is lowered, its general position being a doubled-up one with the knees bent up to the breast, and the arms crossed, the face being turned towards the East. These operations are presided over by a booyl-ya or native sorcerer, whose duty, in addition to the general superintendence of the work, is to ascertain what particular spirit, booyl-ya, or family is responsible for his clansman's death, and to see that the grave lies due East and West. Earth and boughs are then placed on the body, and the deceased's weapons on top of them. A heap of bushes or mound is generally placed over all, and a fire lighted to attract and keep the evil spirit that is responsible for the death, when it returns to the grave; for in case of its finding no fire, it is thought that it will probably go to the next camp and do further mischief. This spirit is supposed to take the form of a small brown lizard called "Bilya Backan," but sometimes another monster called the "Wangul," which is supposed to reside in fresh water lakes, is blamed.

The booyl-yas, to whom allusion has been made, are sorcerers who are always objects of mysterious dread, having power, it is believed, to transport themselves through the air invisibly. They are supposed to be able to cure and inflict diseases by means of bones and other matter which they have invested with evil influence. Other superstitions of the natives are those relating to an evil spirit called "Ginga," which the natives avoid, as they also do "Mullion," a wicked being in a high tree, who seizes blackfellows and devours them in his abode—the Milky Way. A certain form of crystal-gazing exists amongst the aboriginals, but their women are forbidden even the sight of one of the pieces of "teyl," as it is called. With regard to religious superstitions or beliefs, they use a word, "Piama," which signifies the common ancestor of the black folk, and may possibly include the idea of a beneficent deity. It is certain that they cannot grasp the idea of suicide, and notions as to a future state are practically non-existent. The most general of the customs observed by the natives are the holding of the corroboree, polygamy, circumcision, scarring of the person, knocking out the front teeth, and various rites of mutilation to which the youths are submitted before their admittance to the privileges of manhood.

There seems to be some doubt about the localities to which the practice of circumcision is confined, but, according to Sir John Forrest, it is performed South and West of a line drawn from Point Culver to the Geraldine Mine, on the Murchison River. Mr. H. F. Johnston found it prevalent in the Eastern part of the Kimberley district. In this custom, as in many others, there is a striking similarity to those observances enforced amongst the Jews in accordance with the Mosaic law.

Digitized by Google

Of the ceremonies mentioned above, the corroboree is perhaps the most distinctive, although resembling in many points similar customs of the Polynesians. It often takes the form of a war-dance, but seems to have several modifications to suit the celebration of different events. A very usual method of performing it is as follows:—One native stands in the centre of a semi-circle of painted and ornamented savages, who dance in front of him with wild gesticulations and cries, he, for his part, exhibiting different pantomimic gestures expressive of certain events, such as the hunting of emus, kangaroos, etc., and occasionally chanting a descriptive song. These dances are, as a rule, confined to the men, performances by women being exceptional (although, sitting in the background, they frequently join in the chanting). Instances of melodious native chants and recitatives have been supplied by travellers, but generally the singing of the natives in these corroborees is monotonous and unmusical to civilised ears, so that in no way do these functions prove as graceful, picturesque, or attractive as aboriginal performances of the same kind in other parts of the world.

(7.)—Miscellaneous.

Whether the occupation of the State by white settlers has proved a benefit or injury to its original inhabitants is a *quæstio vexata* which had better, perhaps, be left unnoticed; as the evidence, especially in the case of the so-called civilised natives, is somewhat contradictory.

Their past history and present habits do not afford much ground for hopefulness as to their probable future. Turned off their natural hunting grounds, they lack their accustomed means of existence, and have been prone to retaliate for real or imaginary wrongs; this leading to further retaliations on the part of the settlers.

Again, although persons are forbidden by law to supply aboriginals with intoxicating liquors, there is no doubt that the consumption of strong drink by the natives is considerable. This, with other degrading vices, will probably prove their ruin and produce their ultimate extinction, as they are at present rapidly decreasing in number in the settled districts.

The natives are protected in the matter of service to whites by laws which insist on definite contracts equally binding on employers and employees, and illegal unless witnessed by a Justice of the Peace, one of the protectors appointed by the Governor, or some other person appointed by the District Resident Magistrate. The Home Government have always acknowledged their duty to the natives, and every attempt has been made by the Colonial Government to fulfil that obligation. In 1871 the Legislative Council reported that it was desirable to appropriate grants of land to aboriginals. In 1875 an Act was passed giving powers to the principals of native industrial institutions to act as trustees to orphan native children, and in 1877 a reserve of 50,000 acres was made in the Murchison Valley for the benefit of the aboriginals. This grant has been subse-

Digitized by Google

quently (1897) withdrawn, and 100,000 acres on the Forrest River, Kimberley, substituted for it. In 1886 an Act was passed authorising the establishment of a Board for the better protection of the aborigines and the management of aboriginal affairs, and to amend the law relating to contracts with and other matters affecting aboriginal servants.

In 1897 a Bill, which went further still, was passed by both the Houses of Legislature. By this enactment the control of the aborigines was transferred from the irresponsible Board to a sub-department of the State, under the control of a responsible Minister of the Crown, with a provision for the appropriation of a sum of £5,000 per annum for the use of such sub-department; the duties of such department being to apportion the moneys above-mentioned, to distribute blankets and other relief, to provide for the custody of the children of aboriginals, to provide medical assistance and comforts to sick, aged, and infirm natives, to manage the reserves, and to exercise a general supervision and care over the native population of the State.

Nor have private and religious efforts been wanting to ameliorate their condition.

As early as 1846 a Benedictine Mission was commenced by Fathers Serra and Salvado, and, though labouring under what appeared almost insuperable difficulties at first, it is now acknowledged to be an unqualified success.

There are two schools at the mission for the children of the aborigines, one for the boys and the other for the girls. There has been erected a cruciform church of stone, 160 feet long, a monastery, and 50 other buildings of brick and stone, including a flour mill, and factories where all the clothing, boots, shoes, etc., are made for the use of the mission; also dwellings for the married aborigines, and orphanages for the boys and girls. Over 1,000 acres of land have been cleared, and fully 800 acres are under cultivation. There are at the mission postal, telegraph, and money order offices, and a courthouse, where a resident medical officer is stationed.

A number of aborigines are, in return for their labour, lodged clothed, educated, and supplied with all necessaries by the monks of the mission.

The number of aborigines and half-castes at the mission on the 1st January, 1901, is reported to have been as follows:—

Married native men and women	46
Their children (boys and girls)	36
Other native boys under 14	22
Native boys over 14	10
Aboriginal and half-caste girls under 14	23
Native and half-caste girls over 14 ...	9
Aborigines, men (widowers)	3
Aborigines, women (widows)	3
Aboriginal man over 70 years	1
Total	153

Digitized by Google

Since the lamented death of Bishop Salvado, after his long self-sacrifice for the benefit of the Aborigines, in 1900, the mission is now under the charge of the Reverend Father F. Torres.

A mission for the benefit of aborigines of the Kimberley district was founded in 1890 by the Right Rev. Dr. Gibney, the present Roman Catholic Bishop of Perth. This mission is under the charge of the monks of La Trappe, and is situated at Beagle Bay, near Broome.

On the 11th April, 1892, eight missioners, under the command of Abbot Janny, landed in this State, and since then have continued the work with vigour, the whole staff of the mission now comprising five priests and seven lay brethren.

In the early part of the year 1897 a mission was commenced under the auspices of the Anglican Board of Missions, by four lay members of that Church—Messrs. Hale, Ormerod, Lennox, and Gathercole, assisted by a grant from the Aborigines' Protection Board. This mission was devoted to the interests of the natives of East Kimberley, being situated at Camera Pool, on the Forrest River, which flows into Cambridge Gulf. Owing, however, to the extreme hostility of the natives, who wounded and nearly succeeded in killing the leader, the mission was abandoned. Another mission has since been started by one of the party, Mr. Ormerod, associated with Mr. Hadley, at Sunday Island, the results of which it would be premature at present to remark upon.

An Aborigines Department having been established in April, 1898, under Statute 61 Vict., No. 5, the relief granted to indigent natives has been organised under Government supervision, and facilities are thus afforded to obtain a more accurate census of the number of aborigines in the State. Returns are now being received, though not yet complete. According to the census of 1891 the total number of natives in the settled districts mixing with, or in the service of, white people was 5,670, of whom 3,223 were males and 2,447 females. A rough census was taken by the Aborigines Department in 1899 of the natives in contact with whites, the result being as follows:—

Employed.	Relieved.		Self-supporting.
	Regularly.	Partially.	
4,749	743	125	6,690

The total, 12,307, did not include the numerous wild tribes of East Kimberley, nor those roaming to the East of the Goldfields. At the general census of 1901 the number of male Aborigines "civilised or semi-civilised," "in employment or living in proximity to settlements," was found to be 2,936, that of the females 2,324, total 5,260. The number of half-castes was: males, 476; females, 445; total, 921. Those "living in a purely wild state" were not

Digitized by Google

included; this, no doubt, was the case with many of those given as "self-supporting" in the census of the Aborigines Department.

By Act of Council, Rottnest Island was made an aboriginal penal settlement in the year 1841. The native prisoners on the island are employed at farming, gardening, salt collecting and refining, lime burning, cutting and carting firewood, etc.

7.- FAUNA.*

(By Bernard H. Woodward, F.G.S. etc., Director of the Western Australian Museum and Art Gallery.)

Introductory.

The *Year Book* for 1898-9 contains lists of the mammalia and birds of the State; but as so many marsupials have since been discovered, it is necessary to repeat the list with the additions; while in the case of the birds only the names of a few then omitted and of those since discovered can be given, for the revised classification of the birds, after discussions at various conferences of ornithologists during the last thirty years, is at length settled, but will not be received in time for this issue. Lists of the remaining vertebrates (animals with backbones), viz., reptiles, batrachians, and fish, are now published for the first time. Vernacular names are given when such exist, although many of these are most misleading, having been so often applied by early settlers to creatures totally dissimilar in structure to those to which the names belong, owing to some slight external resemblance.

Where the animals occur throughout the State, no locality is given: but where their habitats are restricted they are indicated by the initial letters of the zoo-geographical sub-areas, viz., North, North-West, South-West, and Central, the latter comprising all the interior in which the rainfall is very limited.

I take this opportunity of acknowledging the valuable assistance I have received from Mr. A. W. Milligan, the Honorary Consulting Ornithologist to the Museum, who has written the greater portion of the notes on the birds, and to Mr. Edgar R. Waite, of Sydney, in the identification of some of the fish.

Native Animals.

The Australian region is the most marked of any on the earth; indeed, some authorities think that it constitutes a main zoo-

* For Zoo-Geographical Divisions of the State, see Map on p. 135.

Digitized by Google

geographical region as opposed to the rest of the world, so remarkable are the peculiarities of the mammals to be found in it; for, exclusive of Man and animals introduced by him, the marine mammals, and a few bats and rodents, they are all implacental mammals—marsupials and monotremes, the lowest in organisation of the mammalia, yet offering a wonderful variety of forms and habits.

The order Monotremata contains the lowest of the mammals, which in their structure show some points connecting them with the reptiles. It comprises but two genera, viz., *Ornithorhynchus*, the duck-billed platypus, only found in the Eastern States, and the *Echidna*, the so-called native porcupine or hedgehog, an animal covered with spines, which hide the hair. Of the four species, one, *E. aculeata*, occurs throughout Australia. It is not uncommon in the Eastern districts and North-West of this State. Another belongs to Tasmania, and the two others to New Guinea. Their feet are five-toed and very powerful, enabling them to burrow at a great rate. They have a long narrow snout, small mouth, and long extensile tongue for catching the ants, on which they live. They have no teeth. Like the *Ornithorhynchus*, they lay eggs, which are hatched in a temporary pouch developed during the breeding season. The monotremes are the only oviparous mammals now existing. Their temperature is 20° lower than that of Man, being only 78°. Their skeletons show a marked difference to those of any other mammals in the attachment of the ribs, in the collarbones, and in having the long epi-pubic bones, commonly called "marsupial" bones, as these latter are also found in the marsupials, though in none of the higher mammals.

The marsupialia are divided into two sub-orders:—(I.) The Polyprotodontia (*having many front teeth*), includes the bandicoots, native cats, Tasmanian wolf, etc.; the Phascologale, pouched mice, banded ant-eater, and the American or true opossums, which are all carnivorous or insectivorous, and have as a rule strong canines. (II.) The Diprotodontia (*having two front teeth*), are so called because in most of them the two incisors are strongly developed, while the canines are either rudimentary or wanting altogether. This sub-order comprises the kangaroos, and the Australian opossums or phalangers, and wombats, which are all vegetable feeders.

These sub-orders fall into seven distinct families, as under:—*First*, The Notoryctidæ, containing only a marsupial mole found in the sand plains 1,500 miles North of Adelaide, but which in all probability will be found in the North-East of the Central District of this State; *second*, the Didelphyidæ, the true opossums, inhabiting America, the only marsupial now existing outside the Australian region; *third*, the Dasyuridæ, the native cats, a group of carnivorous and insectivorous marsupials; very remarkable forms occur in the genus *Sminthopsis*, insectivorous animals, in outward appearance barely distinguishable from common mice; two species of these have up to the present been recorded as inhabiting Western

Digitized by Google

Australia, but owing to their diminutive size and nocturnal habits, others have in all probability escaped notice; *fourth*, the Peramelidæ, the bandicoots, soft long-furred insect-eaters, about the size of a rabbit; and the singular pig-footed *Chœropus*, locally known as the "antelope," found in the North and Central Districts of the State; *fifth*, the Phascolomyidæ, the wombats, found only in the Eastern States and Tasmania; *sixth*, the Phalangeridæ, the Phalangers, called, locally, opossums; and *seventh*, the Macropodidæ, the kangaroos, which vary in size from the great kangaroo, *Macropus giganteus*, attaining a length of over five feet from the tip of the nose to the root of the tail, down to the small kangaroo rats.

Dasyuridæ.—The native wild cat, *Dasyurus geoffroyi*, so destructive to poultry, is very common throughout Australia. Its fur is marked by light spots. It is the largest of the carnivorous marsupials of Western Australia. The Phascologale, of which five species are found, are much smaller and more slender. They are arboreal and insectivorous, while the pouched mice (*Sminthopsis*) are still smaller and terrestrial, though living upon similar food. A new species of Phascologale was recently discovered by Mr. Bligh, in the Pilbara district, and is apparently an exception to the rule of this genus, being terrestrial instead of arboreal in habit. The name *P. blighi* has been suggested by the writer. The sub-family of Myrmecobiinæ is limited in its range to the Southern portion of this State and the contiguous parts of South Australia. It contains but one species, *M. fasciatus*, the banded ant-eater, a graceful squirrel-like creature; a tree-climber, though spending most of its time on the ground searching for insects. It has 52 or 56 teeth, the largest number of any known marsupial.

Peramelidæ.—Of the 15 species known, six occur in this State. They are omnivorous, but live chiefly on insects, for which they burrow in the ground. Teeth 46 to 48. The fore limbs have two or three toes only of any use, the remainder being rudimentary. The hind limbs are longer, and have four or five toes fully developed. The rabbit-bandicoot has very long, soft, silky fur, and very large ears. It is not uncommon in the Eastern districts, and extends into South Australia. *P. barrowensis*, discovered by Mr. J. T. Tunney, on Barrow Island, is the smallest of the Bandicoots. A full description has been given by Mr. Oldfield Thomas, in the last volume of *Novitates Zoologicæ*.

Perhaps the most interesting member of this family is the Pig-footed Bandicoot, or Antelope (*Chœropus castanotis*), in which the fore feet have the second and third toes fully developed, and of equal length, the others being rudimentary or absent, while the hind foot is mainly composed of the fourth toe, the others being minute and useless. The vernacular name is due to the striking resemblance of its fore feet to those of a pig.

Phalangeridæ.—The Phalangers, or "Australian Opossums," are distinguished from the other marsupials by the equally-developed hind toes, their nailless but fully developed

Digitized by Google

toes, and their dentition. They are small animals with long noses, ears, and tails, with the tips of the great toes expanded into broad flat pads, which are of great use in climbing trees, on the anterior limbs all the five digits are provided with long sharp claws and the thumb is but slightly opposable. Almost all this family are remarkable for the extreme softness and richness of the fur; the skins, therefore, make exceedingly handsome and durable rugs.

For symmetry of form, grace, and agility of movement, the palm must undoubtedly be given to the "Flying Opossums," locally called "Flying Squirrels." This beautiful little animal has a lateral extension of the skin of the body almost identical with that which occurs in the true "Flying Squirrel"; this membraneous parachute is supported by the fore and hind limbs, consequently they have little or no occasion to descend, as do the ordinary opossums, to the ground, but in the eucalyptus forests, where they take up their abode, intervening chasms of 100 feet or more are easily passed over by the aid of the extended parachute. The movement, however, must be more or less downwards, just as is the case with the flying squirrels and flying lizards, for they have no true power of flight like the bats and the birds, which have the power of flapping their wings and rising and falling at pleasure.

The sub-family *Tarsipedinæ* contains that most remarkable genus *Tarsipes*, of which only one species, *rostratus*, is known. It is the size and colour of an ordinary mouse, but has a long snout and an extensile tongue, which it inserts in flowers to suck their honey. It has only been found as yet in the neighbourhood of Albany.

The *Macropodidæ* are all vegetable feeders; they are divided into three well marked sub-families, of which—

(1.) *Hypsiprymnodontina* is confined to Queensland, but the others are well represented in this State.

(2.) *Potoroinæ*. The Kangaroo rats are small, the length of head and body not exceeding two feet; the claws of the fore feet are large, the ears small and rounded; canines present.

(3.) The *Macropodinæ*, or Kangaroos proper, are all very similar in form and general appearance, and have a characteristic hind foot. In it the fourth toe is very large and strong, and has a powerful claw. On the outer side lies the fifth toe, much smaller, while on the inner side are the second and third toes, excessively slender, and *joined together*: the great toe is wanting. In the Kangaroos the hind feet are more than ten inches in length; in the large Wallabies under ten but more than six inches, and in the small Wallabies under six inches.

During the past twelve months our knowledge of the larger kangaroos has been greatly increased through the endeavours of the committee of the Western Australian Museum to obtain specimens of every indigenous animal, in order that that institution may be fully worthy of its name. To achieve this end the energetic collector, Mr. John T. Tunney, has for the past five years travelled throughout a large portion of the State, and obtained many

Digitized by Google

hundreds of marsupial and many thousands of bird skins, several of which have proved to be new to science. During his peregrinations he spent some weeks on Barrow Island, which is situated 90 miles from Onslow, off the N.W. Coast, where he shot some specimens of a large pale-coloured kangaroo, known only from one imperfect skin, preserved in the British Museum, obtained by Gould in 1841, and named by him *M. isabellinus*. The Director sent specimens of these to Mr. Oldfield Thomas, in order that he might compare them with the "type" specimen in his charge. He has published the results of his investigations in vol. viii. of *Novitates Zoologicæ*, where he shows that this kangaroo belongs to the Wallaroo (*M. robustus*) group. In the same paper he describes another Wallaroo from the Grant Range, Kimberley, and has named it in honour of the writer, *M. robustus woodwardi*. It measures six feet nine inches in extreme length, in colour is a bright rufous in the males, a fawn in the females; it is not quite as large or as bright as the sub-species described by Mr. Thomas, a year earlier, as *M. robustus cervinus*. This is locally known in the Murchison and Gascoyne districts as the hill kangaroo, to distinguish it from the plain kangaroo, the "red" kangaroo (*M. rufus*). It is reported that the Wallaroo proper, which is dark brown in colour, is to be found in the country to the East of the Fraser Range.

The skulls of these three sub-species of Wallaroo vary considerably in their dimensions.

In conclusion, it may be of interest to recall the earliest observations on record of these interesting and peculiar animals. Dampier, who sailed from England on the 14th of January, 1699, and landed at Shark Bay on the 6th of August following, was probably the first Englishman to give a written description of the kangaroo. In his journal he states:—"The land animals that we saw were only a sort of racoon, different from those of the West Indies, chiefly as to their legs: for these have very short fore legs, but go jumping upon them, as the others do, and like them are very good meat." This description certainly does not apply to the "old man" or "plain kangaroo." Probably he saw only wallabies, the smaller varieties, which in former times were very numerous on many of the Islands and in the coastal districts of Western Australia.

Captain Cook, in 1770, discovered on the Eastern coast of Australia a strange looking animal hitherto unknown to naturalists. In his journal under date of the 14th of July, 1770, he wrote: "Mr. Gore, who went out this day with his gun, had the good fortune to kill one of the animals which had been so much the subject of our speculation, and which is called by the natives 'Kanguroo.'" It is remarkable that, while the name does not appear to be known to any of the aboriginal tribes of Australia, it has been adopted for this animal in all European languages, with slight modifications in spelling.

In 1791, Dr. Shaw formed a new *genus* for its reception, which he called *Macropus*, in allusion to the peculiar length of its hind

Digitized by Google

feet, and by the name of *Macropus giganteus*, the "old man" or "boomer" kangaroo has ever since been known. Altogether there are 53 species of kangaroos and wallabies, of which 23 occur in this State. They are all vegetable feeders, browsing on grass and various kinds of herbage, the smaller species also eating roots. They are naturally timid, inoffensive creatures, but the larger ones, when hard pressed, will turn and defend themselves. An "old man" kangaroo will kill a dog, by grasping it with his fore paws and inflicting terrible wounds with the sharp claws on the hind feet, balancing himself meanwhile upon the tail. The kangaroos—before the advent of the pastoralist—formed a very important source of food supply to the aborigines. Indeed the early settlers of this State, from 1829 to 1835, depended largely, in fact at times wholly, upon kangaroo meat, and in those early days it sold in the markets of Perth and Fremantle as high as 1s. 6d. per pound. Later on they were destroyed in great numbers, not only because of the damage they very naturally did in consuming the herbage required for the flocks and herds, but also because the skins had a commercial value. In the year 1851 no less than 29,500 were shipped. Then, for many years, up to 1892, no separate account was kept by the Customs authorities of the different kinds of skins exported. In the latter year we find that 402 bales of kangaroo skins, valued at £27,600 sterling, were sent out of the State.

The Marsupials, although now confined to Australia, with the exception of the American opossums, at one time were world wide in their distribution, as proved by the fossils in the Mesozoic Strata of England, Europe, Africa, and America. Some of these extinct forms were of enormous size, compared with their modern representatives. For instance, the gigantic wombat of Queensland, *Phascolonus gigas*, was as big as a tapir, while *Diprotodon australis* had a skull three feet in length. This enormous marsupial was related to the kangaroo, but its legs were not so disproportionate. Its fossil remains have been found in this as well as the Eastern States.

Within the last few years, in the recent formations of Patagonia, fossil marsupials of the Australian type have been discovered, showing that there must have been a land connection with this continent in comparatively recent geological times.

Insectivorous Bats are plentiful throughout the State, but there is only one indigenous Fruit Bat (*Pteropus funereus*) (Temm), commonly called the Flying Fox, which takes the name from its long fox-like face. This bat is characterised by its large size, being about one foot in length, and its wings, when extended, having a spread of about three feet, by having 34 teeth, the total absence of a tail, and the thick coat of woolly fur covering the neck. It is nocturnal in its habits, and is found in parts of New South Wales, Queensland, the Northern Territory of South Australia, and in the Kimberley District of Western Australia. Fortunately for the fruit-growers, it has never been found South of lat. 20°, and it is safe to say that, separated as it is by nearly 500 miles of compara-

Digitized by Google

tively a treeless stretch of country, it will never make its way into the fruit-growing districts of the State.

Prof. Mosely thus describes a roosting place he visited in New South Wales:—"A dense piece of bush, consisting principally of young trees, which we found were hung all over with these bats, looking like great black fruits. They were in enormous numbers, and uttered a curious cackling sound when disturbed." It is not surprising, therefore, that settlers located near one of these roosting-places should find their orchards devastated in a single night. No native animal is so troublesome to the fruit-growers as this large bat, which commits its depredations in darkness, when it is impossible to guard against its attack. Indeed, it is said that they will fly 30 or 40 miles from their "rookeries" in search of food, and back again the same night.

THE DINGO (*Canis dingo*).—It is more than probable that this animal was introduced by Man, and that it originated from some of the dogs of Asia. The dingo is smaller in size than the wolf, has long legs, a long and somewhat bushy tail, a broad and short muzzle, and well-developed ears. In colour it varies from creamy white to nearly black; it is usually a uniformly light reddish, or yellowish brown, lighter coloured underneath and on the inner side of the legs; the end of the tail is invariably white, as are frequently the feet. The dingo is found all over Australia, and although the large rewards offered for its destruction have led to a great diminution of its numbers, it still remains a terrible pest to the pastoralist. It delights in stealing upon a flock of sheep, and kills and mangles a far greater number than it eats. In its habits it should rather be compared with the fox than with the wolf; it is very shy, and is rarely seen in the daytime. The aboriginal natives of Australia find them as puppies, and rear them with great care; and though they are well treated they often run away, especially in the pairing season. They never bark, and are very useful to the natives for hunting purposes, having a keen scent and a rapid stride, and frequently capturing game on the run.

THE DOMESTIC CAT (*Felis maniculata var. domestica*) has run wild, and is becoming as great a plague as the dingo, and, should it continue to increase in size and numbers at the rate it is now doing, will ere long be a still greater enemy to the agriculturist, for it feeds largely on the lizards and small birds, and if these be reduced in numbers the insect pests will increase in a greater ratio. The Silver Eyes (*Zosterops gouldi*) may eat a few grapes, etc., but how much more fruit would have been utterly destroyed by the thousands of insects they have consumed earlier in the season.

The following list contains all the mammalia of which there is authentic information as to their having been found in this State. No doubt it is far from complete, especially as regards the smaller species of marsupials.

The Australian Natives are treated at length under the heading "Aborigines," while the Seals, Whales, Dugong, etc., are mentioned from the commercial point of view under "Fisheries.":

Digitized by Google

Taking into account man and the animals he has introduced, and the marine species, it will be seen that nine of the twelve orders of the class mammalia are to be found in the wild state in Western Australia.

CLASS I.—MAMMALIA.

ORDER I.—MONOTREMATA.

Family I.—Echidnidæ.

Echidna aculeata [Shaw] "Porcupine," N.W., C., S.W.

ORDER II.—MARSUPIALIA.

Family I.—Dasyuridæ.

SUB-FAMILY I.—MYRMECOBIINÆ.

Myrmecobius fasciatus [Waterh.] "Banded Ant-eater," C. and S.W.

SUB-FAMILY II.—DASYURINÆ.

Sminthopsis crassicaudata [Gld.] "Fat-tailed Pouched Mouse," C.
Sminthopsis murina [Waterh.] "Common Pouched Mouse," S.W.
Phascologale blighi [Woodw.], N.W.
Phascologale calura [Gld.] "Lesser Brush-tailed Phascologale," S.W.
Phascologale penicillata [Shaw] "Brush-tailed Phascologale," S.W.
Phascologale flavipes var. leucogaster [Gray] "Yellow-footed Pouched Mouse," S.W.
Phascologale apicalis [Gray] "Freckled Phascologale," S.W.
Dasyurus hallucatus [Gld.] "Northern Australian Dasyure," N.
Dasyurus geoffroyi [Gld.] "Geoffroy's Dasyure," S.W.

SUB-ORDER I.—POLYPROTODONTIA.

Family II.—Peramelidæ.

Chœropus castanotis [Gray] "Pig-footed Bandicoot."
Perameles barrowensis [Thos.] "Bandicoot," Barrow Island.
Perameles bougainvillei [Q. and Gld.] "Striped Bandicoot," S.W.
Perameles macrura [Gld.] "North-West Australian Bandicoot" N.W.
Perameles obesula [Shaw] "Short-nosed Bandicoot," S.W.
Peragale lagotis [Reid] "Rabbit Bandicoot," S.W.

Family III.—Phalangeridæ.

SUB-FAMILY III.—PHALANGERINÆ.

Trichosurus vulpecula, var. fulginosus [Ogilb.], "Black Opossum," S.W.
Trichosurus vulpecula [Kerr], "Common Opossum," S.W.
Pseudochirus occidentalis [Thos.] "Western Ringtailed Opossum." S.W.
Petaurus breviceps [Waterh.] "Lesser Flying Opossum," N.W.
Dromicia concinna [Gld.] "Lesser Dormouse Phalanger," S.W.

SUB-FAMILY IV.—TARSIPEDINÆ.

Tarsipes rostratus [Gerv. and Verr] "Tarsipes," S.W.

SUB-ORDER II.—DIPROTODONTIA.

Family I.—Macropodidæ.

SUB-FAMILY I.—POTOROINÆ.

Potorous gilberti [Gld.] "Gilbert's Rat Kangaroo."
Potorous platyops [Gld.] "Broad-faced Rat Kangaroo."
Bettongia lesueuri [Q. and G.] "Lesueur's Rat Kangaroo," S.W.
Bettongia penicillata [Gray] "Brushtailed Rat Kangaroo," S.W.

Digitized by Google

SUB-FAMILY II.—MACROPODIDÆ.

Lagostrophus fasciatus [P. and L.] "Banded Wallaby," N.W.
Lagorchestes hirsutus [Gld.] "Rufous Hare Wallaby," N.W.
Lagorchestes conspicillatus var. leichardti [Gld.] "Spectacled Hare Wallaby," N.
Lagorchestes conspicillatus [Gld.] "Spectacled Hare Wallaby," N.W., Barrow Island.
Onychogale lunata [Gld.] "Crescent Wallaby," S.W.
Onychogale unquifera [Gld.] "Nail-tailed Wallaby," N.
Petrogale inornata [Gld.] "Plain Rock Wallaby."
Petrogale concinna [Gld.] "Little Rock Wallaby."
Petrogale brachyotis [Gld.] "Short-eared Rock Wallaby."
Petrogale lateralis [Gld.] "West Australian Rock Wallaby," N.
Macropus brachyurus [Q. and G.] "Short-tailed Wallaby," S.W.
Macropus eugenii [Desm.] "Dama Wallaby," S.W.
Macropus agilis [Gld.] "Agile Wallaby," N.
Macropus irma [Jourd] "Black-gloved Wallaby," S.W.
Macropus rufus [Desm.] "Red Kangaroo," N.W. and C.
Macropus isabellinus [Gld.] "Isabelline Kangaroo," N.W. Barrow Island.
Macropus robustus [Gld.], C. "Wallaroo."
Macropus robustus var. cervinus [Thos.], C.
Macropus robustus Woodwardi [Thos.], N.
Macropus giganteus [Zimm] "Great Grey Kangaroo," S.W.

ORDER IV. CETACEA.

Balænoptera sibbaldi [Gray] "Sibbald's Fin Whale."
Delphinus delphis [Linn] "Dolphin."

ORDER V.—SIRENIA.

Halicore australis [Owen] "The Dugong," N.W.

ORDER VI.—UNGULATA.

Sus scrofa (1) [Linn] "Pig."
Equus caballus (1) [Linn] "Horse."

ORDER VII.—RODENTIA.

SUB-ORDER I.—DUPLICIDENTATA.

Lepus cuniculus (1) "Rabbit."

SUB-ORDER II.—Simplicidentata.

Mus burtoni [Ram], "Burton's Rat," N.
Mus albocinereus [Gld.] "Greyish White Mouse," C.
Mus nanus [Gld.] "Little Rat."
Mus gouldi [Waterh.] "White-footed Mouse."
Mus assimilis [Gld.] "Allied Rat."
Mus fuscipes [Waterh.] "Dusky-footed Rat,"
Mus rattus (1) [Linn] "Black Rat," S.W.
Mus decumanus (1) [Linn] "Brown or Norway Rat."
Mus musculus (1) [Linn] "Common Mouse."
Hydromys fuliginosus [Gld.] "Sooty Beaver Rat," S.W.
Hapalotis longicaudata [Gld.] "Long-tailed Hapalotis."
Hapalotis penicillata [Gld.] "Pencil-tailed Hapalotis."
Hapalotis mitchelli [Gray] "Mitchell's Hapalotis," S.W.
Hapalotis hemileucura [Gray] "Elsey's Hapalotis," S.W.

(1) Introduced by man.

Digitized by Google

ORDER IX. CHIROPTERA.

SUB-ORDER I.—INSECTIVORA.

Vesperugo pumilus [Gray] "Little Bat," South Perth.
Chalinolobus morio [Gray] "Chocolate Bat," Perth.
Chalinolobus gouldi [Gray] "Gould's Bat," S.W.
Nyctinomus australis [Gray] "White-striped Bat," C.
Nyctophilus geoffroyi [Leach] "Geoffroy's Nyctophilus," S.W.
Nyctophilus timoriensis [Geoff.], "Western Nyctophilus," S.W.

SUB-ORDER II.—FRUGIVORA.

Pteropus gouldi [Peters] "Red-naped Kalong," N.

ORDER XI. CARNIVORA.

SUB-ORDER I.—PINNIPEDIA.

Otaria forsteri [Lesson] "Sea-bear" (Seal).

SUB-ORDER II.—FISSIPEDIA.

Felis maniculata var. domestica (1) [Briss.] "Cat."
Canis dingo (2) [Blumenb.] "Dingo."

ORDER XII. PRIMATES.

SUB-ORDER I.—ANTHROPOIDEA.

Section I.—Catarrhini.

Homo sapiens [Linn] "Australian Natives."

(1.) Introduced by man. (2.) Probably introduced by man.

CLASS II.—AVES.

THE BIRDS OF WESTERN AUSTRALIA.

Of the 780 described species of Australian birds, at least 500 occur in Western Australia. The expression "at least" is used advisedly, as it is safe to speculate that, as the extreme Northern and South-Western portions of the State are not, in an ornithological sense, thoroughly explored, science will not only be enriched by the knowledge of species already occurring in other States of the Commonwealth, but also by the discovery of species absolutely new. In the Northerly directions indicated we may expect to hear of the discovery of members new, at least, to Western Australia, of the beautiful Fruit-eating Pigeons, of the equally beautiful Honey-eaters, and possibly of the brilliant-plumaged Pittas or Ant-thrushes.

In speaking of Western Australia, it is generally conceded that it is singularly rich in wealth and beauty of its floral forms, but on the other hand it is the subject of common remark that the State exhibits a great paucity in the numbers of the individuals composing its bird life. The latter conception, however, is not borne out by facts. No individual State of the Commonwealth is as rich as Western Australia in the number and variety of its individual forms, and the reasons for this are not difficult to ascertain and comprehend.

Digitized by Google

It is only necessary to look once at the map of the Continent to learn that the State embraces, within its confines, regions, tropical and sub-tropical, temperate and sub-temperate, with their intermediate gradations. Its extensive sea-board, extending from Kimberley, on the North, to Eucla, on the South, and measuring, roughly speaking, 5,200 miles, sentinelled by innumerable islands, islets, banks, and shallows, grouped and isolated, provides congenial resorts and sustenance for hosts of sea and shore birds. Its characteristic chain of coastal lakes, lagoons, and swamps, and its vast inland lakes, maintain myriads of waterfowl and aquatic birds, and its almost illimitable scrubs and forests, its plains, rivers, and brooks, provide food and shelter for numbers of feathered tenants, while even its dry desert areas and its tracts of spinifex and sand are not without avi-faunal inhabitants.

As with the flora, many of the forms are anomalous, singular, and exclusive in habitat. Such Eastern endemic forms as the Lyre-birds (Menura) are absent; but, on the other hand, the State shares with the other divisions of the Continent such remarkable groups as the Mound-builders, or Mallee hens, and the architectural Bower birds.

Many of the recorded species of Western Australia are visitants, in the sense that they visit our shores and lands in order to escape the rigorous winters of their own lands. The immigration of others, again, is periodical and due, among other reasons, to the need of obtaining seasonable supplies of food. Others, again, are, so to speak, inland or restricted immigrants, whose domiciles are Australian, but who, according to the season, make periodical visits to breed. Others are nomadic, or migratory in a very restricted sense, and move from locality to locality as the food supplies of a particular kind become exhausted. Others, again, are local and stationary, obviously, because the localities they inhabit furnish a perennial supply of food, and satisfy all their other requirements.

One of the most confusing and vexatious phases to the student of ornithology in Australia has been that of the classification, both scientific and vernacular. For many years the scientific classification of Gould, as regards Australian birds, has been universally adopted. Contemporaneously and subsequently other classifications, which were, perhaps, entitled to greater scientific weight, were promulgated. It is gratifying, however, to record that the subject of classification of the whole of the birds of the world, including, of course, Australian ones, has been settled by the leading ornithologists of the Old and New Worlds. The full text of the classification has not yet reached us, and, in consequence, the old classification has, perforce, and for the purposes of this article, had to be adopted.

On the subject of vernacular classification, the attribution of erroneous vernacular names to Australian birds has proved one of the greatest impediments to the popularisation in Australia of the study of ornithology. The many grievous errors which exist were

Digitized by Google

made and perpetuated by, and are readily traceable to, the early colonists, who, obviously, not possessed of even an elementary knowledge of ornithology, gave the common names of British groups to Australian groups upon the most slender external likenesses. One or two familiar examples will suffice to show the mischievous effects of such misnomers. Take for example the bird in Australia commonly known as a "Magpie." The British magpie, after which the Australian one was called, is a member of the Crow Family, and occupies an intermediate position between the Nutcrackers and Jays. Not only is the Australian bird not of the same genus, but it belongs to quite another family, that of the "Butcher-birds." The Australian bird is really a butcher bird in robust form. Take another example, namely, the Robins. The British Robin Redbreast is closely allied to the Nightingales, and is a member of the "Warblers" or Sylviidæ. One of the so-called Australian robins belongs to the Flycatchers, another to the Babbling Thrushes or Timeline Family, and still another to the Thickheads. Further examples may be cited in the Tits and Wrens.

With the evident object of remedying these evils, several leading Australian ornithologists, after full consideration and deliberation, published and issued a vernacular list of Australian birds. The object, indeed, was a laudable one, but the good results which might have been expected were minimised to some extent by an evident spirit of compromise to existing misnomers, for we find perpetuated the application of such names as "Wrens," and "Tits," and "Robins," to birds which have little in common with the British groups which are entitled to those names by long appropriation. Many similar instances could be enumerated.

Before proceeding to refer more specifically to the Orders, Families, and Genera of Western Australian birds, attention is especially directed to the diminutive, symmetrically-formed, and brilliantly-plumaged Maluri, or so-called Wrens; to the Weaver Finches; to the larger and equally brilliantly-plumaged Honeyeaters; to the gorgeously plumaged Ant-thrushes, and to the Cockatoos and Parrots.

In the following observations and notes, the different sections of avi-faunal forms will only be touched upon lightly, and the whole subject must necessarily be limited in scope and skeletal in character:—

Accipitres—Birds of Prey.

The Accipitrine order of birds comprehended that class of birds known as "Birds of Prey," and until lately included the sub-orders of the "Owls" (*Striges*), the Ospreys (*Pandiones*), and the Falcons (*Falcones*). Adopting the view held for some time past by many modern zoologists, the Owls have now been assigned to a separate order.

As, however, the new classification has, as before stated, not reached the State in its complete form, the old classification must, for the purposes of this article, necessarily be adopted throughout.

Digitized by Google

Under it the Sub-order of Owls (*Striges*) is sub-divided into two families, viz., the "Owls Proper" (*Bubonidæ*), and the "Barn Owls" (*Strigidæ*).

This sub-order in this State is neither rich in genera nor in the numbers of such genera.

Such "Old World" genera of the "Owls Proper" as the "Eagle Owls" (*Bubo*), the "Tufted Owls" (*Scops*), the "Snowy Owls" (*Nyctea*), the "Hawk Owls" (*Surnia*), and the "Little Owls" (*Carnine*) are not found in Western Australia.

The "Owls Proper" are, however, not wholly unrepresented, for Western Australia has four species of the genus *Ninox*, included in which is the form *Ninox boobook*, which utters the cry "More-pork," which call is generally but erroneously attributed to a member of the "Goatsucker" family.

Of the "Barn Owls" Western Australia possesses one genus and two species.

The second sub-division of the "Birds of Prey" contains the Ospreys (*Pandiones*), a sub-order occupying an intermediate position, and forming a connecting link between the Owls and the Falcons. The sub-order, which as a whole embraces only two genera and six species, is represented in Western Australia by one genus and one species, *Pandiones leucocephalus*. The gigantic nest-structures of this bird are found on the rocky islets and prominences along the Western Australian coast. The birds add to and occupy the one nest year after year. Mr. A. J. Campbell, F.L.S., recorded and photographed, in the year 1885, a nest near Cape Mentelle, in the Caves District in the South-West Division of the State, and last spring eggs were taken from the same nest and presented to the Museum. The Government has, at the suggestion of the Museum authorities, wisely placed the nest under the protection of the Cave-Warden.

The third division of the "Birds of Prey" comprises the true raptorial birds, such as Secretary birds, Vultures, Long-legged Hawks (*Accipitrinæ*), Buzzards (*Buteoninæ*), Eagles (*Aquilinæ*), and Falcons (*Falconinæ*).

Neither the Secretary birds nor the Vultures are found in Western Australia. The Long-legged Hawks, which embrace the Harriers (*Circus*), the Goshawks (*Astur*), and the Sparrowhawks (*Accipiter*), are, however, present. Of the Harriers two are found, one of which is more commonly known as the "Swamp-hawk"; of the Goshawks three species are known, and of the Sparrowhawks one is recorded and is fairly abundant.

The Eagle family, which comprises the Buzzard Eagles (*Archibuteo*), the True Eagles (*Aquila*), the Sea Eagles (*Haliaëtus*), the Kites (*Milvus*), and the Buzzards (*Buteo*) is only sparsely represented.

No Buzzard Eagles are found, but a closely allied form is present in the Little Eagle (*Nisaëtus morphnoides*).

Digitized by Google

"Eagles Proper" are unrepresented, although the Wedge-tailed Eagle (*Uroaëtus audax*) is closely allied to them. Of the Sea Eagles, three species are recorded, including the cosmopolitan *Haliaëtus leucogaster*. Of the true Kites (*Milvus*) only one species is known.

The purely Australian forms, the Square-tailed Kite (*Lophoictinia isura*) and the misnamed Black-breasted Buzzard (*Gypoictinia melanosterna*) are closely allied. Of the Black-shouldered Kites two species are recorded, including the well known Letter-winged Kite (*Elanus scriptus*).

The Honey Kites (*Pernis*) of the Old World are not present in Western Australia.

Of the Falcon family, Western Australia has four species of true falcons (*Falco*), but no Gyrfalcons, and one true kestrel (*Cerchneis cenchroides*), a familiar form in open country.

In addition, Western Australia has a genus (*Hieracidea*) which is almost strictly Australian, and which occurs between the Gyrfalcons and the true Kestrels.

Passeriformes—Perching Birds.

This Order embraces by far the greatest number of known species in the world. Briefly speaking, they are classified under four great sections, named the Singing Passeres (*Oscines*), the American Passeres (*Tracheophonæ*), the Non-singing Passeres (*Oligomyodæ*), and the Australian Scrub-birds (*Atrichornithes*).

It is proposed, however, not to follow these sections, but to treat them *in solido*, without differentiating between them.

The first section, the Singing Passeres, includes the forms of such well known families as the Crows (embracing the rooks, ravens, jackdaws, true crows, magpies, jays, and choughs), the Starlings (embracing the true starlings and the field starlings), the Orioles, the Finches (embracing among others the hawfinches, the chaffinches, the goldfinches, the sparrows, the bullfinches, and the buntings), the Larks (embracing the skylarks and other larks), the Wagtails and Pipits, the Creepers and the Nuthatches, the Tits (embracing the many tits and the reedlings), the Goldcrests (embracing the goldcrests, firecrests, and rubycrests), the Shrikes (embracing the butcher-birds and woodchats), the Chatterers (embracing the waxwings), the Warblers (embracing among others the true warblers, white throats, black caps, the tree warblers, the reed warblers, and the hedge warblers), the Thrushes (embracing among others the golden thrushes, black birds, song thrushes, nightingales, red-breasts, the blue-throats, red-starts, and wheat-ears), the Accentors (embracing the hedge sparrows and dippers), the Wrens, the Bulbuls, the Flycatchers, and the Swallows (embracing among others the house-martins and chimney swallows).

Digitized by Google

Of the Crow family, we have neither the rook, the jackdaw, the magpie, the chough, nor the jay. On the other hand we have a true raven (*Corvus coronoides*), a carrion crow (*Corone Australis*), and a member of an allied genus.

In Western Australia the Carrion Crow is one of the most ubiquitous, and consequently most common, of avi-faunal forms, Frequently, however, he is mistaken for the Australian Raven. whom he much resembles; and when both are either in repose or motion it is indeed difficult to distinguish between them. When in hand, the difficulty disappears, inasmuch as an examination of the bases of the body feathers will betray the Crow by their whiteness. The Australian Crow is omnivorous. He devours fruit as readily as carrion, and his frequent presence on the shallows of estuaries and upon sea banks definitely indicates his partiality for the dregs of marine life. One of his physical pecularities is the change of the colour of the dull hazel eyes in the young bird to china-white in the adult. Mr. Milligan first observed this change whilst keeping them in captivity, and as recently as last year he shot two of three birds resting together in a tree, one of which (apparently the younger) had the dull hazel eyes referred to, and the other (apparently the adult) had white eyes. He is true to his type, in that he is an arch-robber of eggs in the farm-yard; and, indeed, indigenous birds are not exempt from his depredations in the same direction. Another corvine form we have is the Leaden Crow-shrike (*Strepera plumbea*), better known to the settlers as the "Squeaker." Along the South-West coast, both in the forest and coastal scrubs, these birds are found in vast numbers. They, like the Crows, have a penchant for fruit, and particularly the enveloped drupe of the Cape gooseberry. They are extremely noisy birds, and with a variety of calls, one of which, a peculiar modulated one, invariably presages changes of the weather.

The next family of the Singing Passeres are the Orioles, which are represented by two species (*Oriolus viridis* and *Oriolus affinis*). The former is a migrant to the lower latitudes, visiting us in early Spring for the purpose of breeding. His note much resembles his specific name. He builds a pendulous dome nest, generally in the Casuarinae. He is a perfect mimic, choosing the notes of the Shrike Thrush for preference.

The second-mentioned Oriole is only found in the Northern parts of the State.

Western Australia has not any representative of the Starling family. Neither are any of the forms of European Finches found. The place of the latter, however, is taken by the Weaver Finches (*Ploceidæ*), a family comprising some of the most charming and brilliantly plumaged forms of Australian bird life. They vie with the Parrots, Honeyeaters, and Pigeons in variety and brilliancy of colour. This characteristic, combined with their miniature forms and their readiness to adapt themselves to captive life, make them popular favourites. Their song is plaintively sweet, but weak. It is almost ungenerous to single out a species for distinction; but

Digitized by Google

special reference must be made to the Gouldian Finch. The whole of the genus, excepting one species, are inhabitants of the Northern and interior parts of the State. The one exception, the Red-eared Finch, is found in the South-West, and is locally known as the "Java Sparrow." His favourite haunts are the sage-bush scrubs on the coastal brooks and springs. His nest is composed of long grass, and is bottle-shaped in form.

The next family, namely, the Skylarks, are not represented in Western Australia. An allied genus (*Mirafra*), however, is found, embracing two species (*Mirafra horsfieldi* and *Mirafra woodwardi*). The latter is a species lately found on the sand tracts near Onslow, in the North of the State, and described by Mr. A. W. Milligan, and named by him after the writer. The predominating ashy grey plumage of the former is supplanted by rich rufous in the latter. Since the publication of the description, the nest and eggs of the new species have been described, and they differ in some respects, and in a material degree, from those of the former.

The Crow-shrikes, or "Butcher-birds," are a well-known family of Western Australian birds, and include such homely forms as the so-called "Magpies" and "Whistling Jackasses." As already stated, the common black and white bird which we call a "magpie" is nothing more nor less than a big "butcher-bird." Of the so-called "Magpies" (genus *Gymnorhina*), we are said to have three species, the "Black-backed," the "White-backed," and the "Long-billed"; but it is indeed doubtful whether we have more than one species, "the long-billed" (*Gymnorhina dorsalis*). As the bird is so common in captivity, its life history is in consequence so well known that it is unnecessary to go into further detail. During the breeding season the male bird (presumably) flutes during the night *sotto voce*.

The Butcher-birds are more generally called "Whistling Jackasses." There are five Western Australian species, and all are classed under the genus Cracticus. The Western Australian representatives are true types, in that they impale smaller birds on thorns or sharp wooded projections of trees, and doubtless, as with the European members of the family, they have their so-called "larders" or food depositories. Although naturally pugnacious and cruel, they nevertheless meet enemies more powerful than themselves. Mr. Milligan recalls an instance where, one afternoon, whilst snipe-shooting, in Victoria, he witnessed the common Butcher-bird so hotly pursued and pressed by a Sparrowhawk, that the former was forced to the ground. Following them up quickly, he discovered them engaged in such earnest combat that he could have caught them both. As it was, he stood beside them, and leisurely put his gunbarrel on the pursuer and pursued, which had the effect of separating them, and of affording the Butcher-bird the opportunity of getting away, which he did with as much speed of flight as a disordered plumage would permit. Included in the same family are the "Shrike-tits," "Bell-birds," "Shrike-robins," and "Thick-heads."

Digitized by Google

The White-bellied Shrike-tit (*Falcunculus leucogaster*) is not commonly found, although not distinctly scarce. The genus to which he belongs is exclusively Australian. His hawk-like head and dark crest give him a pugnacious appearance, but his looks belie him, for he is very shy in disposition and secluded in habit, being found only in the umbrageous trees of the forest. His handsome yellow breast, black throat, and black crest make him a conspicuous object. The so-called Bell-bird (*Oreioca cristata*) is another member of the same sub-family, and also bears a crest. He is, so to speak, an ornithological orphan, and appropriates a genus to himself. Like the White-bellied Shrike-tit, he is purely Australian. He owes his common name to his ringing bell-like notes, and, in addition, he is a ventriloquist.

The Shrike-robins (*Eopsaltria*) comprise two forms, the Grey-breasted (*E. georgiana*) and the White-breasted (*E. gularis*). The first-named are found distributed through the jarrah and red gum forests, and are fairly numerous in the neighbourhood of Perth. The vernacular name does not fully describe the colours of the bird, of which a lemon yellow is the most marked. His song is not remarkable, although pleasing; he is, in addition, the possessor of great ventriloquial powers. His nest is a beautiful structure, frequently placed in the fork of a small banksia, and ornamented with comparatively long ribands of bark. These ribands in turn harmonise with the colour of the bark of the trees, and being attached and suspended to the rim of the nest, the latter readily escapes detection.

The White-breasted Shrike-Thrush is common enough in the South-West part of the State. His partiality for the dense undergrowth of the brooks in that locality makes it a most difficult task to flush and secure him. When close pressed, he makes calls very like the cry of a cat.

Of the Thickheads, there are six species. The Western, the Rufous-breasted, and the Red-throated are the most common. The former is abundant in all the scrub and forest country, and may be frequently seen in the native trees and scrub in the suburbs of Perth. His yellow breast and white throat, separated only by a black crescentic band, and his black head, make him particularly conspicuous. His beautiful, clear, long-drawn notes also aid to mark his identity. In some localities he is called the "Thunder-bird," owing to an apparent disposition to make his song more emphatic immediately before a thunderstorm. The Rufous-breasted Thickhead is readily distinguishable from the former by reason of his rich rufous breast. His song, which is one note continuously repeated and ending with a noise like the crack of a whip, enlivens the bushlands in spring and summer more than that of any other bird. The note is strong and clear, and in breeding season almost continuous throughout the day.

During last spring he could be heard in almost every shrubbery in Perth. The Red-throated *Thickhead* (*Pachycephala Gilbert*

Digitized by Google

a fairly common form. It was named after Gilbert, Gould's able coadjutor, who devoted so many years of his life to the study of Western Australian ornithology.

The Family of Warblers is poorly represented, only one species occurring in Western Australia, called the "Longbilled Reed Warbler." In most of the reed and rush swamps about Perth its bright cheery note is heard. A pair may frequently be heard in the reed beds in the Queen's Gardens, East Perth. The Third Swamp Reserve, at North Perth, is another favourite haunt, and at Monger's Lake, Leederville, they are in great numbers. The nest, which is attached to the reeds, is a beautiful structure. The very few night singers in the world are found in this family. As before stated, the Thrush-family, which includes such well-esteemed European members as the Song-thrush, the Nightingale, and the Redbreast, is not found in Western Australia. The well-known Australian songster, locally called the "Native-thrush" (*Collyriocincla brunnea*), is not a true thrush, but is a "Wood-Shrike."

We have neither a true Robin Redbreast nor a true Wren, nor in fact any of the Wren family.

Of the Wagtail family we have not a representative, and of the Pipits one only, the so-called "Ground Lark," *Anthus australis*. The species is widely distributed, and may be found in any grass cultivated, or open, lands, and also upon the sea coasts.

Speaking of the Wagtails, the pretty black and white fantail (*Rhipidura tricolor*), which we see hopping or flying around cattle, and which is often called the Wagtail, must not be confounded with the "Wagtails." The bird referred to belongs to the Flycatcher family.

The Family of "Creepers" is represented by five species, which are all assigned to one genus, *Climacteris*. In the localities in which they are found they are invariably called "Woodpeckers," which they certainly are not, the latter belonging to another Order of birds. The Tree-creepers, which are arboreal in habitat, ascend trees spirally by running around and around the trunks.

The Rufous Tree-creeper, found in the Darling Ranges, near Perth, and in the South West of the State, affords an instance of protective colouring. The colour of the whole plumage is a uniform dull rufous, and harmonises agreeably with the bark of the trunks of the red gum and jarrah trees upon which they live.

Although Western Australia has not a true Fly-catcher, nevertheless she possesses a great number of most interesting forms closely allied, which include the so-called "Robins" and "Wrens," and also the "Flyeaters" and "Fantails." Almost everywhere in the scrubs and forests one meets with the beautiful Scarlet-breasted Robin, *Petroeca campbelli*. It is fairly abundant in the banksia scrubs on the Swan and Canning rivers, near Perth. Another form, the Hooded Robin (*Petroeca bicolor*) is in places plentiful, but it is more local in its habit. Independent of those mentioned there are three other species of the genus Petroeca

Digitized by Google

found. As a whole they are remarkable for their fearlessness of man. Of another genus (*Pseudogerygone*) we have one species, the Southern Flyeater. Although a small creature of modest brown plumage, it nevertheless has a remarkable combination of quaint plaintive notes. It may be seen and heard almost any day in the pollarded eucalypt trees in Stirling Street in the City of Perth.

We now come to one of the most interesting and beautiful of the genera of Australian birds, the so-called "Wrens" (*Malurus*). They are purely Australian, and owing to their insectivorous habits and their beauty are not only useful in a pronounced manner, but also ornamental to a degree.

It is remarkable that while the males are invariably gorgeous, the females on the contrary are clothed, as a rule, in common brown. In their domestic habits they are polygamous, one male bird being, in some species, accompanied by a coterie of seven females; this statement has not, however, the concurrence of all ornithologists. They are also remarkable for the "nuptial" plumage the male bird assumes at the beginning of the breeding season.

As songsters they are not remarkable, but nevertheless some species possess a series of bright, cheery, piping notes, which help to enliven the scrublands. Some make their habitat in the low-growing open scrubs, others again prefer the scrubs in the forests.

One of the most common forms in and around Perth and the Darling Ranges is the "Banded Wren," *Malurus splendens*. Clothed almost wholly in deep violet blue, with reliefs of light green on the wing coverts, and of a crescent black velvet band, we realise in him a "thing of beauty" truly exquisite.

In the "White-winged Wren" and the "White-backed Wren" species the predominant blue is relieved with white. In the "Lovely Wren," the "Variegated Wren," and the "Red-winged Wren," the blue is relieved with red or chestnut, in combination with other colours or shades. Of the many Wrens the "Purple-crowned" is one of the most singular and beautiful, owing to the beautiful lilac cap which covers the head. Two other Maluri are worthy of note, the "Red-backed Wren" (*Malurus dorsalis*) and the clumsily-named "Bower red-backed Wren" (*Malurus bowerii*), in both of which the predominating colours are blood-red and black.

Leaving the so-called Wrens, we come to the Fly-catcher family, which comprises the Fantail Fly-catchers (*Rhipidura*), and Fly-snappers (*Myiagra*). Although failing in point of beauty in comparison with the Wrens, they nevertheless are elegant and distinctly useful birds to man and domestic animals. Of the Fantail Fly-catchers one of the most common is that called the "Western Fantail" (*Rhipidura preissi*). The members of the species do not exhibit the slightest fear in the presence of man. Wherever there is a brook or permanent water, there will these birds be found. They are easily identified by their large fan-shaped ta

Digitized by Google

and their restless movements. The aborigines of the South-West regard them as birds of ill-omen, and any arranged undertaking will be abandoned should one of these fearless little creatures appear in their camp immediately beforehand. The white man, however, regards them differently, their presence and vivacity at all times occasioning delight. Another common form is the "Black and White Fantail." Almost anywhere out of the business part of the City of Perth these elegant birds may be seen about the houses and grounds, and particularly where cattle and horses are kept. Flying around the heads of stock, or perching upon their backs, either whilst feeding or recumbent, they may be seen freeing the animals from the myriads of insect forms which cause annoyance.

The Fly-snappers are characterised by a sheeny-bluish black and white plumage. They also serve man in keeping down the numbers of insect forms. The Restless Fly-catcher (*Seisura inquieta*) is another long elegantly-shaped bird, and its vernacular name denotes its demeanour. It is also known as the "Scissor-grinder bird," owing to the striking resemblance of some sounds which it utters to the noise of a scissor-grinder's machine.

The members of the Swallow family are so well known as hardly to require description. Western Australia has one true swallow (*Hirundo neoxana*), a representative species of the "Chimney swallow," of Europe. There also are two genera allied to the Martins, which includes the Tree Martins (*Petrochelidon*). The Tree swallow (*Petrochelidon migricans*) is common enough in the bush around Perth.

Almost every "piped" jarrah on the banks of the Swan has its little colony of these birds, who appear to spend their existence in circling and re-circling, with copious twittering, around their arboreally selected homes. Many of the Martins are remarkable for their song, others, again, for their beautiful nests, which are made to accord with their surroundings in order to insure concealment from their natural enemies.

The Nuthatches are another European family of Passerine birds, but they are only represented here by an allied genus, the Tree-runners, *Sittella*. Three species are included in the genus. The one common in the Swan River district is the "Black-capped Tree-runner." Small colonies of these, except in the breeding season, are frequently met with in the suburbs of South Perth. Like the Tree-creepers they are arboreal in habit, but instead of spirally ascending a tree, as the Tree-creepers do, they descend.

The family of "Tits" (*Paridæ*) is represented by three members, which have been allotted to two genera. No typical Tit is, however, found in Western Australia, the genera mentioned being only allied. The individual members of either genus are not abundant. The "Wedgebill," which is the sole representative of the second genus (*Sphenostoma*) is, in addition to his characteristically conical and powerful bill, also possessed of a crest.

Digitized by Google

Having now exhausted all those sections or groups of the Passerine birds in Western Australia, which have relation to those found in Britain, it is proposed to refer briefly to those families which are strictly Australian or Western Australian, or allied to families other than those of Britain.

Of these, the family of Wood Shrikes (*Prinopinæ*) first claims our attention.

Heading the list is one of the most singular forms in Australian ornithology, namely the "Magpie Lark" (*Grallina picata*), or, as it is often called in some localities, "The Pugwall." About the Swan River district it is not what may be called a common bird, although in many of the other States, and particularly in the settled districts, it is as frequently seen as the so-called "Magpie." An odd pair or so may be seen at Guildford, and similarly at Cannington. It is an elegant bird in shape, and that, combined with its decided homeliness and fearlessness among the settlers, has established it as a favourite. Its nest, which is composed of mud, and of the size and form of a small pudding basin, is placed usually on the limb of a dry tree or upon the clear limb of a living tree with scanty foliage. The reason for its choice of situation appears to be to avoid the destruction of the nest by rain drops from the leaves, which inevitably would occur were it placed upon the under branches of a heavily-foliaged tree. Young birds kept in captivity become very tame, and soon learn to mitate words; but they are far from robust when so kept.

Two other Western Australian members of the same family are the "Brown Shrike-Thrush" and the "Buff-bellied Shrike-Thrush." Along the Canning Brook, in the neighbourhood of Kelmscott, in the Darling Ranges, they are, comparatively speaking, numerous. So far as the Western Australian bush is concerned, they easily take the pride of place in song, particularly the former, for its notes are clear, liquid, and thrush-like, so that in many localities the bird is known as the "Native Thrush." Two other forms comprising the genus (*Pinarolestes*) are found in the Northern parts of Australia.

Another distinct family are the Cuckoo-Shrikes or "Caterpillar-eaters," comprising three species, to each of which a genus has been assigned.

One of the three species is named the "Ground Cuckoo-Shrike" (*Pteropodocys phasianella*); it is found in the North. A second, common in Southern latitudes, is called the "Black-faced Cuckoo-Shrike," or sometimes the "Black-faced Graucalus," but more generally the "Blue pigeon." Needless to say that, ornithologically, it is far removed from the Pigeon family. It does great service to orchardists and agriculturists in devouring the larvæ of noxious insects, but as a set-off it levies on the fruit. It is easily identified by its chaste, slaty-grey plumage, relieved only by the deep blackness of its cheeks, and also by the continuous movements of its wings when the other portions of its body are in repose. The third species is the White-shouldered Caterpillar-

Digitized by Google

eater. Its vernacular name is furnished by its character. At certain times of the year it is not uncommon on the Canning River, near Perth, and can be identified by its wholly black and white plumage, excepting the wing and shoulder, which are tinged with brown. Its notes are pretty and prattlesome.

We now come to the family of Honey-eaters (*Meliphagidæ*), the members of which comprise some of the most beautiful and at the same time brightest and most vivacious forms of Western Australian birds.

The Family, as individuals, are very numerous, and this might reasonably be expected from the marked disposition of so many of the Western Australian floral forms to flower freely during seasons other than that of spring, and thus to furnish those food supplies which are essential to the existence and well-being of the birds under notice. The plumage in most instances is brilliant, and the forms are elegant, and these characteristics, combined with these birds' vivacity, brightness, and tuneful song, render them charming in bush life.

The Family has been subdivided into four sub-families, the first of which is the *Myzomelinæ*, in which are included the genera *Myzomela* and *Acanthorhynchus*. The first genus comprises four species, all of which are inhabitants of the Northern parts of the State. The Red-headed Honey-eater (*Myzomela erythrocephala*) is a study in scarlet and dark brown, the former colour encompassing the head, neck, and chest, the latter the remainder of the body. Of the latter genus (*Acanthorhynchus*) we have that form, found almost everywhere both in the bush and in the gardens, known as the "Spinebill" (*Acanthorhynchus superciliosus*). His long slightly curved bill, which he uses to probe into the flower-cups, his chestnut and white throat, and his bright clear continuously repeated note, fix his identity and indicate his presence. The Spinebills are purely Australian forms.

The next Sub-family (*Zosteropinæ*) includes two genera, *Zosterops* and *Melithreptus*. The genus *Zosterops* includes that very numerous class of birds known as the "Silver-eyes," with the more local name of "greenies."

The Perth "greenie" (*Zosterops gouldi*) is a too familiar form in orchards, and bears an unenviable reputation as a destroyer of ripening fruit. The evidence as to its ravages in the direction indicated is overwhelming; but orchardists blindly, it is contended, only keep a debit account. They do not appreciate, or possibly are ignorant of, the incalculable good these birds do in the destruction of the various insect pests which abound in Western Australia. Observation made by qualified persons proves what an invaluable part these birds perform in regard to the destruction of the latter, and that the birds are not given credit to the extent they should be. It is suggested that systematic observation should be undertaken by the Agricultural Department of the State during all seasons, excepting the fruit, in regard to the quantities of noxious

Digitized by Google

insects which these birds consume. For instance, birds might be shot at stated periods during the day, and their crops and stomachs examined, and the results accurately recorded. An idea of the numbers in which these birds exist may be gathered from the fact that in one orchard on the Swan River, near Perth, at least 20,000 birds have been shot. In an orchard near Bunbury 1,200 of these birds were shot in one day.

Three species other than the one just described are found in the more Northern latitudes. The plumage of these, which comprises combinations of olive green, yellow, white, and grey, makes some of them surpass in beauty the slandered Perth "greenie."

The genus *Zosterops*, unlike most of the Western Australian Honey-eaters, is found in almost every part of the Old World. Each species has the distinguishing badge, so to speak, of the genus, namely, a narrow encircling white zone around each eye. The other branch of the sub-family *Zosteropinæ* is the *Melithreptus*, a genus strictly Australian. The species common around Perth and in the Southern latitudes is the Western White-naped Honey-eater (*Melithreptus chloropsis*), and may be found almost anywhere where the eucalypts flourish. He does not restrict his food to the honey of flowers, as many of the Honey-eaters do, but includes in his diet pollen and insects.

In the great Karri forests of the South-West these birds are very numerous. The bird may easily be identified by its black head, partially encircled with a crescentic white band, and by its greenish-olive mantle and white under-surface. Its pugnacity and "scolding" voice also aid in its identification.

Three other *Melithrepti* are also found in Western Australia.

The next sub-family of the Honey-eaters is the *Meliphaginæ*, and includes some of the most beautiful of the honey-eaters, such as *Glyciphila*, *Entomophila*, *Ptilotis*, *Meliornis*, *Manorhina*, *Acanthochæra*, and *Philemon*. Of the genus *Glyciphila*, we have four species. The members of this genus are remarkable for their powers of flight, and in that they feed on insects. The Fulvous-fronted Honey-eater (*Glyciphila fulvifrons*) may be found at times in the neighbourhood of Lake Jandakot, in large colonies, feeding on the small "bottle-brush" bushes. Their presence may easily be detected a long distance off by their peculiarly weak flute-like notes, which they seem to utter in concert. The birds are of most restless habit, and, when disturbed, often rise to a great height in the air, and then fly off to a great distance, a habit which is rarely found with the family in general.

The honey liquids of the flowers, upon which they feed, frequently produce intoxication in them to such a degree as to render them incapable of flight or motion. They do not uphold the meliphagine reputation for beauty of colouring, their predominating colour being an ashy brown. The fulvous or tawny crown of the head, however, at once renders identity certain. Two other species (*G. albifrons* and *G. fasciata*) occur in Northern latitudes and in

Digitized by Google

the interior. The white head of the former, together with a remarkable blood-red naked spot near the eye, and a mottled throat, form certain distinguishing marks. The other species (*G. fasciata*) is remarkable for the black "lacing" on the head and chest. The fourth species (*G. ocularis*), or the Brown Honey-eater, is one of the most common birds in the thickets and scrubs on the Swan River. It is easily recognised by its almost uniform dark-brown coat and its great activity and almost ceaseless voice. Thousands of them may be found in the suburb of South Perth, in the thickets adjoining the roads. A miniature of the same species is found in the North, which has been named *G. subocularis*, and appears as a "sub-species." As the two birds materially differ in size, although similar in most respects, the subtle distinction of sub-species, if a distinction of the nature is admissible at all, might be dispensed with. The genus is confined to Australia and some islands Northward.

Three forms of the genus *Entomophila* occur in the Northern parts of Western Australia, and, although not highly coloured, are nevertheless beautiful.

The genus *Ptilotis*, the Plumed Honey-eaters, contains the most beautiful members of a beautiful family, and appropriately may be termed the "excellency of excellencies." At the same time they are numerically stronger in individual members than other genera composing the family. They are almost purely Australian, and the range of the remainder does not extend farther than New Guinea and the adjacent islands. Next to the Brown Honey-eater the most common one about Perth is the Singing Honey-eater (*Ptilotis sonora*). Its clear ringing alarm notes betoken its presence, and its dark grey plumage, relieved by yellow ear coverts, make it easily recognisable. He is unlike most members of his family in that his food consists principally of insects.

The Wattle-cheeked Honey-eater (*Ptilotis cratitia*) is one of the most handsome of them all. Its predominating colours are black and yellow. The head, neck, and upper back are black, lightened by a triangular yellow region around the eye. The remainder of the plumage is yellow, the breast and other portions of the undersurface being laced and arrowheaded with dark lines. The wings and tail are also yellow, relieved with dark edgings. A distinguishing characteristic is the warty excrescences covering the face. Two others of the genus, *Ptilotis keartlandi* and *P. leilavalensis*, are very recently-described species. The White-plumed Honey-eater (*Ptilotis penicillata*) is remarkable in possessing a tuft of white silky feathers behind each ear covert.

The remaining members of the genus share the beauty of their congeners.

Another genus (*Meliornis*) is not only a purely Australian form, but still further restricted in its habitat, being only found in Southern latitudes. In Western Australia three species are comprised in the genus. The White-cheeked Honey-eater (*Meliornis*

Digitized by Google

sericea) is comparatively abundant on the Swan and Canning Rivers, in favoured localities. This species and the next succeeding ones are locally called "Yellow-wings," owing to the wax-yellow burnishing on the outer edges of the wing feathers.

Both are also readily recognisable by their course of flight, which is at first perpendicular, and then lateral to the objective. The white-cheeked has, in addition to the burnished yellow edged wings, a black head, white frontal band, and white silky ear coverts. These birds catch their insect prey on the wing, after the manner of the Fly-catchers. The Moustached Honey-eater (*Meliornis mystacalis*), is, as its name denotes, possessed of a broad moustache formed by an expanded patch of white feathers at the back of the ear coverts. Both birds are of a shy disposition, although at certain times they are pugnacious in a pronounced form. Cases of partial albinism have been recorded in the first-named species.

Other forms of the Honey-eaters are the "Minahs" (*Manorhina*), variously spelt "mynah" and "miner." They are the "alarm" birds of the forest. The genus is an Australian one. There are three Western Australian species, the most common of which in Southern latitudes is the Dusky Minah (*Myzantha obscura*). Small companies of them may be found in that strip of bush country between the Canning and Swan Rivers at the back of Victoria Park. They are the noisest and most restless birds in the bush. Immediately the presence of a person is discovered, the sentinel bird gives the note of alarm, which is then taken up at once by the others. The company, however, does not fly away, but approaches bush by bush with incessant garrulity until the object causing alarm has passed out of sight. The Dusky Minah is very local in its habits. Where a company is once located, the finding it in or about the same spot may be depended upon.

Two other species, the Yellow-throated Minah (*M. flavigula*) and the Yellow Minah (*M. lutea*) are found in the North. The plumage of the latter is distinctive on account of its soft grey and lemon-yellow forehead and same coloured bill.

The Wattle-birds (*Acanthochæra*) are comprised in the next genus, and number three species. They are exclusively Australian. The Little Wattle-bird (*A. lunulata*) may be found anywhere in the Swan district in the banksia scrubs and forests. His frequent deep guttural notes betray him. He is remarkable in not having a fixed time for breeding, and the results of systematic observation in this State show that young birds may be found in almost every month of the year. Another species, the Red Wattle-bird (*A. carunculata*), is not so numerous about Perth. He is much larger than the last preceding species, and is distinguishable by pendulous blood-coloured wattles springing from underneath the eye space. He is a noisy bird, with deep guttural notes; whilst feeding he frequently utters a note resembling the word "grog," and at other times his voice resembles a *terrier's bark.*

Digitized by Google

Wales (in which latter place they considered excellent for table pur- essed and drawn, are improved by when they lose the eucalyptine ure of their food In Tasmania an article of food, and by many this State.

Western Australia called the Spiney- common.

e Honey-eating family is that of eads" (*Philemon*). They are the king birds we have, and when dded, they are certainly the most ss is emphasised by a long bill, a the upper mandible, and still ely, in some species, denuded of Friar-bird (*Philemon argenticeps*) wo other species (*Philemon citreo-* n any way common.

nteresting sub-family of the Honey- birds and the Pardalotes, *Dicæum* bird, though common, is rarely small size, and secondly through its fy retreats of high trees. Where- s hang, there will this handsome mantle wings, and tail are of glossy contrast to its bright scarlet throat en. Its song is pretty and cheerful.

nd-birds form another interesting They also are characterised by beautiful eason of any masses of brilliant of the disposition of colour in small Besides the enjoyment they afford by habits in searching the foliage of d, they also perform services to man see pests. In many localities they are the indifference they exhibit in the ference has been erroneously attributed and the local name has been bestowed ng might possibly be logical if the ght At certain seasons of the year ed with a whitish scale, whereupon attack them. It is then a marvellous infested and watch the busy gaily- dreds clinging and running over the ng their prey. The noise they make ches and leaves can only be likened to on the leaves. When the attack is

Digitized by Google

directed on the low-growing bushes, the birds may be approached without stealth and touched by the hand.

Of this genus the form most commonly met with at Perth and its neighbourhood is the Red-tipped Pardalote (*Pardalotus ornatus*). It is locally called by various names, including those of the "Wittychu," in imitation of its common note, and the "Pickwick," owing to a similar reason. In the South-West portions of the State the same species is numerous, but another species, the "Spotted Pardalote" (*Pardalotus punctatus*) is more so. One of the first bird-notes that is heard in the great karri forests is the "Sleep-baby" of this latter species. Owing to the number of the birds and the frequency and persistency of utterance, their notes become monotonous, and the bird in consequence is called in some localities the "Headache Bird." They form their nests in soft banks of earth by tunnelling a passage two or three feet long, the end of which they enlarge into a small chamber. In this terminal chamber the nest is made of soft bark. The black head of this diminutive bird is spotted with white, and colours and shades of grey, olive brown, rufous brown, red, yellow orange, and tawny, are disposed in agreeable combination about the body plumage. The three remaining species are Northern and interior forms, and vie with, if not excel, the others named in plumage beauty.

Still continuing the Singing *Passeres*, we have the family of Wood Swallows (*Artamidæ*), of which the genus *Artamus* is the only one.

These birds not only receive the name of "Wood Swallows," but are also called "Summer Birds" and "Wood Martins." Some of the species are, so far as the extreme Southern parts of the State are concerned, merely visitants from the Northern and warmer parts. In and about Perth and the Darling Ranges one species permanently remains, and may be seen throughout the whole of the winter months. In the colder portions of the State, and on the approach of winter, these birds collect preparatory to a final flight to a more congenial home, and during that time they cluster and hang from the limbs or open hollows of trees like bees. They always appear in small companies, and frequently different species are comprised in the company. After a thunder shower they have a habit of soaring high, all in company. Their flight is a graceful, wheeling movement. They are very tame, and invariably build their open nests in low shrubs. Instances are recorded where companies comprising two species of these birds have taken full possession of a shrubbery for nesting purposes. The most common form in the Swan River District is the Grey-breasted Wood Swallow (*Artamus cinereus*), and which is the species above referred to as possessing a fixed perennial abode. The most beautiful of the eight members of the genus is the White-eyebrowed Wood Swallow, his dark chestnut under surface marking him from the other members of his genus. The Masked Wood Swallow is also another distinctive member, his black head resembling a mask, being further accentuated by a band of white.

Digitized by Google

He is frequently to be seen about Perth, in late Spring. The remaining five species are found principally in the North and in the interior.

The last remaining sub-family of the Singing *Passeres* to be described is that of *Timeliidæ* or Babbling-thrushes. They comprise some of the most singular forms of Western Australian ornithology, and many of its members perform useful services for man. They may be considered as the "assorted samples" of bird life. The family is further subdivided into two sub-families, the Bower-birds (*Ptilonorhynchinæ*), and the Babblers (*Timeliinæ*). The first sub-family, namely the Bower-birds, embrace only one genus (*Chlamydodera*), and two species. It is common knowledge that these birds are remarkable for the bowers which they build. These structures, which are built of twigs made to arch, are quite distinct from, and must not be confounded with, their nests. The bowers are simply love arbours where the males disport themselves for the evident delectation of the females. Every attempt is made to beautify them by the proprietors by the introduction of bright coloured substances, shells, etc. Both species (*Chlamydodera guttata* and *C. nuchalis*) are denizens of the North. The predominating body colours of the former are brown and buff, the wings being spotted with a richer buff. A beautiful rose pink band crosses the back of the neck. The predominating shades of the latter are grey, modified by dashes of brown and yellow. A like band of rose pink is almost similarly placed as in the former.

The second Sub-family of Babblers is headed by the Emu Wren (*Stipiturus malachurus*). It will be observed that it belongs to a family quite distinct from the group of so-called Wrens before described as Fly-catchers. The birds under notice are almost incapable of flight. On the coastal hills in the South-West they inhabit the dwarf scrubs which only reach knee high. There they live in small families. Their voices are not as loud as that of a cricket, and so close do they keep to their terrestrial homes that it is a matter of considerable difficulty to flush them, and when flushed they only fly a few yards and drop down in the prickly undergrowth. They can rarely be flushed a second time, and when hotly pursued with a dog, may be seen running along the ground through the scrub after the manner of mice. The birds are not much larger than a man's thumb, but the seven long scantily-plumed tail feathers (which are more than twice the length of the bird) incline to make the birds look larger. The male bird has a beautiful light blue throat and chest, and the crown of the head reddish chesnut The South-West aborigines do not appear to have the same legend regarding them—namely, that they take the form of departed spirits—that the aborigines of the other States have. A second species (*Stipiturus ruficeps*) has lately been discovered and described. The genus is exclusively Australian.

The Bristle-birds (genus *Sphenura*) are also an exclusively Australian group of remarkable ground-dwellers. They are materially larger than the Emu Wrens, being nearly eight inches in

Digitized by Google

length. Owing to a pronounced liking for dense low-growing scrubs and reed beds, it is most difficult to secure specimens. There are two known species in Western Australia (*Sphenura longirostris* and *Sphenura litoralis*), the latter having been discovered by Mr. A. W. Milligan, the Honorary Consulting Ornithologist of the Perth Museum, in October last, in the South-West, and subsequently described by him. They frequent the coastal scrubs adjacent to the short brooks, which are fed by subterranean water issuing from the limestone cliffs. The song is most melodious, and the notes clear and liquid. The bird has many calls, of which some betoken alarm, and one of which very much resembles the syllables, "titch titch doo-flay."

Another interesting Timeline genus is that of the *Amytis* or Grass Wrens, of which there are five indigenous species. This also is a strictly Australian genus. They move about in small troops, and also belong to the ground dwellers. A new species (*Amytis gigantura*) was lately discovered by Mr. Tunney, the Museum Collector, and another (*A. housei*), by Dr. House, the naturalist to the Kimberley Exploring Party, and both of these have been described by Mr. Milligan.

The Grass Birds (*Megalurus*) are another group of birds that live in concealment. The only one found in Western Australia is *Megalurus gramineus*. He frequents the thick cover in marshy places, and is most difficult to find. His mournful note may be heard in the samphires growing in the marshes on the Swan River, near Burswood Island.

Another diminutive form and an inhabitant of grassy and reedy places is the Grass Warbler (*Cisticola exilis*). In Victoria it shares favoured grassy spots with the Stubble Quail. It appears to leave a body scent, for sporting dogs will frequently stand at the place from which it has just arisen.

The genus *Acanthiza* also belongs to the Timelines, and comprises in Western Australia four species. They are very small birds, and in consequence have got the misleading name of Tits.

The genus is very generally distributed throughout Australia. One species (*Acanthiza chrysorrhoa*) is without exception the most useful of birds to the orchardist. They move about in small families of 10 to 15, and are familiar forms in every garden and shrubbery, where they free the trees and shrubs of blight, scale, and noxious insect life. The popular name given to the species is "Tom-tit." The nest, which is a large structure, is known to every schoolboy, and is peculiar in that it has a false nest or "cock's nest" on the top side of the dome of the structure. The nest is generally considered to be specially constructed for the use of the male bird, and undoubtedly he uses it, but it may also serve as a resting place for the fledged young when the nest cavity becomes too small to contain the growing birds. Frequently a new nest is added to the old one, and it is generally thought that an abandonment of the old tenement is made in favour of the new. This may or may not be so. Observa-

Digitized by Google

tions should be directed to see whether or not each nest is tenanted by a separate pair of birds. They bring out at least two broods in the year.

The Plain-coloured Tit (*Acanthiza inornata*) is another form found in Western Australia, but although tame in disposition, it rather shuns the haunts of man and seeks the bush. The Broad-tailed Tit (*Acanthiza apicalis*) is a denizen of the scrubs, which it enlivens with its shrill song. It is a ludicrous sight to see one of these vivacious birds seek a point of vantage in the scrubs, and elevating its tail in an upright manner, whistle with all its vocal might. The remaining species, *Acanthiza pyrrhopygia*, differs from the others in that its plumage is reddish in the lower back and upper tail coverts. The genus of Scrub Wrens (*Sericornis*) is purely Australian, and embraces two local species. One species (*Sericornis maculata*), like the Emu Wren, inhabits the dense dwarf scrubs and rarely resorts to flight. Perched on the top of a small shrub, it utters a series of clear, liquid notes. The ground birds (*Cinclosoma*) are represented by three species. They are unlike most of the Timeline birds before described, as they are inhabitants of the plains where clumps or bush are interspersed. They are much larger birds than those just described, reaching in some instances a length of nine inches.

The Scrub Robins (*Drymaædus*) are represented by two species. One species has its home in the North and the other in the South.

The Ground Wrens (*Hylacola*) are represented by one species only.

Of the Coachwhip Birds (*Psophodes*), there is but one species, the Black-throated (*Psophodes nigrogularis*). His home is in the South-West coastal scrubs, out of which it is a most difficult task, and one requiring great address, to get him, or even to get a glimpse of him. Locally he is known as the "Rainbird," owing to his habit of seeking the tops of the coastal hills and singing immediately before any decided change in the weather. His song is remarkably clear and striking, and almost inimitable. No other bird in Western Australia has a series of notes like his, and, in addition, he is a perfect ventriloquist. From observations made in this direction, the first notes of the series appear as if the bird were distant a quarter of a mile, the next series of notes being much closer, and so on, until the author of it is located in a shrub not more than a few feet away from the listener. If his skin is desired, then action must be taken at once, for the next moment the seeker will be confused, as the notes come apparently a few feet behind him, and then from one side, then from the other side, till confusion is worse confounded. One *ruse* which has been successful is for the seeker to fire one barrel into the shrub in which the bird has been located, and if there is a clear space, then to await for a quick-running shot as he rapidly runs (for he rarely flies) across the clear space; that is to say, if the bird involuntarily complies with the seeker's desire.

Digitized by Google

So secretive are his habits that, although the local aborigines are familiar with his call, they have (as they allege) never seen one.

Another section of Timeline birds, known as the Babblers (*Pomatorhinus*), comprising two species, is found in the State. The genus is not exclusively an Australian form, for members are found in India. In some localities they are called "Cat Birds." They move about together in small companies, and they make their presence known by their noisy babbling voices and their fussy jumping movements. Unlike most of the Timelines, they are arboreal in habit.

The so-called Songlarks (genus *Cincloramphus*) are Timelines, Western Australia possesses two species. One frequents the open forest country and the other the grassy plains. The Brown Songlark (*Cincloramphus cruralis*) is a familiar form in the agricultural districts. He is much larger than the Anthus or Ground-lark, and is distinguishable by the lark-like manner in which he arises straight into the air, uttering his melodious song. Disparity in size marks the sexes, the male being double the size, at least, of that of the female. The other species, the Rufous Songlark (*C. rufescens*) is much smaller, and possesses a redder colouring on certain portions of the body. Specimens of the former have been shot at Maddington.

The Field Wrens (*Calamanthus*) comprise one species, *Calamanthus campestris*. As its specific name implies, it is an inhabitant of grassy places. Its power of flight is very limited.

The remaining group of the Timeline birds, not described or previously referred to, and which exhausts the list of the Singing *Passeres*, is the genus *Ephthianura*, the "Chats." The group comprises four species. One species (*Ephthianura albifrons*) is a common form in moist saline places. Scores of them may be seen in the vicinity of the West Australian Cricketing Association Grounds, and frequently during the progress of cricket matches they alight on the same grounds and unconcernedly feed. At certain times of the year hundreds of these birds may be seen on the rapidly-drying salt lakes West of Kelmscott. The generic name of the group reduced into English means "languid-tailed," which is an apt name: and their antithesis is found in many of the Flycatchers and the Wood-swallows, whose tails are ever moving.

The *Ephthianura* have also one of the habits of the Lapwings and Dottrels when their nest is approached, namely, that of feigning to be wounded. The members of the species are easily identified by their white heads and throats and breasts, separated only by a narrow collarette of velvety black. Two other species are brilliantly coloured, namely, the Tri-coloured Chat (*E. tricolor*), which has a bright scarlet head and under surface, except the throat, which is white; and the Yellow-fronted Chat, which has the head and under surface golden orange and the throat black. These latter are, however, far from *common*.

Digitized by Google

The last division but one of the *Passerine* birds contains the remarkable Australian Scrub Birds (*Atrichornithidæ*), which present another singular form of Australian bird life.

One of the two known species is limited to the coastal scrubs near Albany, and along the South coast to Cape Leeuwin; and is called the Noisy Scrub-bird (*Atrichornis clamosa*). Like many of the Timeline birds, it inhabits the dense scrubs, and is rarely seen. Up to the present no female bird has ever been shot (so far as is known) or scientifically described. Its note is aptly described as a sharp whistle, repeated eight or nine times rapidly, with crescendo concluding in a sharp crack. The nest and eggs were only very recently discovered and described.

The last family of *Passerine* birds left for notice is the Pitta or Ant-thrush (*Pittidæ*), which belongs to a family having its home in India, and is remarkable for its gorgeous colouring.

Only one species up to the present has been discovered in Western Australia, namely, the Rainbow Pitta (*Pitta iris*), which occurs in the North. Its body colours are a harmonious, though marked, combination of black, ferruginous, yellow, brown, green, and scarlet.

Picine Birds.

The Picine or Yoke-footed birds comprise those families of birds known as the "Woodpeckers" and "Wrynecks." Neither family is represented in the State. The Tree-creepers are popularly confounded with the Woodpeckers, but, except in one external characteristic, there is nothing in common between them, and their ornithological connection is wide apart.

Cuculine Birds—Cuckoos.

The birds of this order embrace the cuckoos and allied families, Western Australia possesses only one true cuckoo, the Pallid Cuckoo (*Cuculus pallidus*), and so far as the Southern portions of the State are concerned, it is a migrant only. The familiar note of the European species, which gives it its name, is not possessed by the colonial representative. The Pallid Cuckoo is true to cuculine tradition as regards its parasitic habits in not building a nest of its own, but using that of other birds for the hatching of its eggs, and also with regard to its polyandrous practices. In addition to those enumerated, Western Australia possesses other cuculine forms included in the genera. *Cacomantis*, *Mesocalius*, and *Chalcococcyx*, the Bronze Cuckoo, the Koel (*Eudynamis cyanocephala*) and the gigantic cuckoo, known as the "Channel-bill" (*Scythrops novæ-hollandiæ*), are found in the Northern portions of the State. Some idea may be formed of the size of the Channel-bill when it is stated that its total length is 24 inches, and that of the Pallid Cuckoo 12 inches. The "Lark-heeled" Cuckoos (*Centropodinæ*) are represented by the "Pheasant Coucal" (*Centropus phasianus*), a bird pheasant-like in external form, which is not characteristically cuculine in habit, in that it builds its own nest, hatches its own young, and is not polyandrous.

Digitized by Google

Picarian Birds.

This remarkable order of birds embraces the Swifts (*Cypselidæ*), the Night-jars (*Caprimulgi*), the Frogmouths (*Podargi*), the Humming birds (*Trochili*), the Bee-eaters (*Meropes*), the Hoopoes (*Upupæ*), the Kingfishers (*Halcyones*), and the Rollers (*Coraciiæ*).

The first sub-order, the Swifts, includes the "true swifts" (*Cypselinæ*) and the Needle-tailed Swifts (*Chæturinæ*). Of the True Swifts, Western Australia possesses one genus and one species (*Microprus pacificus*), and of the Needle-tailed Swifts, also one genus and one species (*Chætura caudacuta*). The Edible-nest Swiftlets (*Callocalia*) have not been recorded in Western Australia.

Of the second sub-order, the Night-jars, one true Night-jar (*Caprimulgus macrurus*) and one allied form (*Eurostopus argus*) are found in the State. Of the Frogmouths, one genus and two species are recorded.

The Humming Birds are not represented. Of the Bee-eaters, one genus and species is known (*Merops ornatus*). This very interesting form bears in the vicinity of Perth the local name of the "Golden Swallow," and is a migrant—arriving in October and leaving in early autumn.

Its predilection for bees is undoubted. Its mode of nesting—by burrowing chambers in soft cliffs and railway cuttings—is of especial interest. Where a cliff or bank is not available, it burrows a chamber into the flat surface of the soil, and one instance is on record where a pair occupied the "piped" limb of a jarrah tree, in which a reddish earth had been formed by internal decay.

The Hoopoes are unrepresented in Western Australia, but reparation is made in the numerical strength of the Kingfishers.

This latter sub-order comprises two sub-families, the Fish-eating Kingfishers (*Alcedininæ*) and the Insect or Reptile-eating Kingfishers (*Dacelininæ*).

Of the Fish-eaters, Western Australia possesses one, the Purple Kingfisher (*Alcyone pulchra*). This genus is distinctive from all other kingfishers in that its members have three toes on each foot instead of four. Of the Reptile-eaters, Western Australia possesses two genera (*Dacelo* and *Halcyon*), each having three species. In the former is included the "Laughing Jackass" of the colonists.

The common form, in late spring and in summer, of the Sacred Kingfisher (*Halcyon sanctus*) is only a visitor to the Southern portions of the State, arriving there in early summer.

Psittaci—Parrots.

This order embraces the families of the Lories or Brush-tongued Parrots (*Loriidæ*), the Cockatoos, and Cockatoo Parrakeets (*Cacatuidæ*), and the Parrots and Parrakeets (*Psittacidæ*).

The Parrot family have attained distinction among birds by reason of their comparative high order of intelligence. They also are distinguished by their brilliant and varied plumage

Digitized by Google

comprising the only birds that have the sense of taste defined. They appear to occupy that position in *Aves* that monkeys do in their class; they also much resemble them in being able to climb with facility, and in this respect the strong-hooked mandibles assist them. Another characteristic of Parrots resembling that of the monkeys is the employment of the toes as an aid to convey the food to the mouth, and holding and separating it during the progress of eating. Most of the members of the family bear captivity well, and whilst in that condition learn readily to imitate man in voice and gesture. Longevity is also another of their characteristics.

Western Australia is fairly well represented in all sections of the order.

The first-named family, the Lories (*Loriidæ*), are honey-eating birds, and to better enable and assist them in the extraction of food from flowers they are furnished with pencilled or brush-like tongues. The predominating colour in most of the lorikeets is green, which harmonises well with the foliage of the trees whereon their subsistence is obtained.

The most common West Australian form of the Lory is the Purple-crowned Lorikeet (*Glossopsittacus porphyrocephalus*). It gains its food supplies from the flower cones of the banksias and the blossoms of the eucalypt trees, which they visit in large companies. Often companies may be seen flying over Perth city, uttering at intervals the note "skreet." The deep indigo blue crown of the head gives it its specific name. Its vivid green body colouring, relieved with the under surface orange-red, provides a brilliant contrast. The name given to it by the aborigines of the South-West is Cowara. Cowaramup Point, South of Cape Naturaliste, is named by the aborigines after the bird, the compound word meaning the "resort of the Cowara."

A much larger form is the Red-collared Lorikeet, which is an inhabitant of the North, and is a handsomely plumaged bird, where royal blue, orange, red, olive, green, and yellow meet in various and harmonious combinations.

The only other West Australian Lory described is the Varied Lorikeet (*Ptiloscera versicolor*), another inhabitant of the North. Its red head and its green clothing are varied only by a red patch of feathers on the breast, streaked with green or yellow.

The Cockatoos (family *Cacatuidæ*) are subdivided into two sub-families. The first (*Cacatuidea*) comprises three genera, and the second, one genus, the Cockatoo Parakeet (*Calopsittacus*).

The members of the former sub-family are characterised by a sombre body plumage and well-developed and extremely powerful mandibles, which they use in stripping the soft barks from trees in search of grubs. Included in the sub-family is the genus *Calyptorhynchus*, which includes the well-known "Black Cockatoo" of the settlers (*Calyptorhynchus Baudini*). The species is exclusively *Western* Australian, and is generally distributed throughout the

Digitized by Google

Southern latitudes, in the red gum, jarrah, and banksia country. Its melancholy wail and laboured flight are well known. It flies about in both small and large companies, whose whereabouts may always be discovered by their frequent grating noises whilst seeking and eating their food.

At times the companies exhibit great restlessness and make long flights. When these happen, with the invariable accompaniment of their weird wail, it is accepted by the settlers as a certain indication of approaching rain.

The bird is often shot for the purpose of food, and as such is said to be toothsome.

Another member of the same species is the Red-tailed Cockatoo (*Calyptorhynchus stellatus*), which is distinctly a forest species. In lieu of the characteristic inner white-tail coverts of the "Black Cockatoo," the Red-tailed Cockatoo, as the name implies, has them red. About Christmas time it is, comparatively speaking, numerous in the karri forests of the South-West. The third and last species found in Western Australia is the Great-billed Cockatoo (*Calyptorhynchus macrorhynchus*). The home of the species is in the North. Its body colour is bluish black, and its tail feathers are banded with scarlet.

The second genus (*Cacatua*) comprises, among others, the White Cockatoo and the Galah. The White or Sulphur-crested Cockatoo is a familiar captive form. In *naturalibus* it is both arboreal and terrestrial. Its food supplies are for the most part obtained on the ground, freshly-sown wheatfields being always preferred. Upon these they will descend in hundreds, and work great destruction. When feeding, sentinel birds are posted, and on an alarm note being sounded, the whole flock arise simultaneously and seek the loftiest tree available. Here they are on guard, and on such occasions no *ruse* for their destruction by the gun can be adopted successfully, nor their vigilance eluded.

Farmers who suffer from their depredations lay poison for them, but the birds become crafty and refuse to be tempted.

One of the handsomest forms of the family is the Pink or Leadbeater's Cockatoo. It is supposed to cross and re-cross the desert between Western Australia and the other States. Its beauty consists in its snow white mantle suffused with rose pink, with a deeper pink encompassing the undersurface and the whole of the head. The crowning glory, so to speak, is a beautiful erectile crest barred with white, crimson, and yellow. Like the rest of its congeners, it does well in captivity and is companionable.

Another form is the beautiful Blood-stained Cockatoo (*Cacatua sanguinea*). Its coat is white like the white cockatoo, except that certain blood-red patches appear on the sides of the face. The sulphur crest of the white cockatoo is in this bird supplanted by a cap of white feathers. Another form is the Bare-eyed Cockatoo (*Cacatua gymnopis*), and the last, but certainly not less, interesting of the genus *is the Galah (Cacatua roseicapilla)*. Everyone is

Digitized by Google

familiar with the pink breast and undersurface and slaty-blue mantle of this popular captive. He is undoubtedly one of the best of our speaking birds, and the facility with which he can imitate the human voice and its inflections and human gestures is remarkable.

The remaining genus of the sub-family is *Licmetis*, the Long-billed Cockatoos. They are unlike the Cacatuine birds previously described, by reason of their much more robust and longer mandibles, which are specially adapted for procuring their food supplies in the ground.

Western Australia has two species: *Licmetis nasica*, commonly known as the Corella, and *Licmetis pastinator*, or the Dampier Cockatoo. In each a naked space around the eye breaks the almost wholly white plumage. Both are inhabitants of the North, the latter particularly of the Dampier Archipelago, where it is said the birds were first observed by Dampier in 1699, for they build in the cliffs on the islands of the Archipelago.

The second sub-division of the Cockatoo family comprises one species only. It is known as the Cockatoo Parrakeet (*Calopsittacus novæ-hollandiæ*), and augments the list of the world's "bird orphans."

In general appearance (excepting colour) it is like a cockatoo in miniature, and possesses, as most of the cockatoos do, a crest.

The birds prosper in captivity, and make very lovable pets. The colours are not to say brilliant, but they are soft and agreeable in their harmony. The predominating colour is soft ashen grey, the shoulders white, the crest and face citron yellow with each ear coverts encompassed with a red patch; the crest is long. They are ground feeders and gregarious, and are prolific breeders.

The next family—*Psittacidæ* (Parrots)—is represented in Western Australia by two sub-families, the *Palæornithinæ* and the *Platycercinæ*.

The former sub-family comprises three genera. The members composing the genera are all distinguished by their graceful proportions and slender pointed tail of exceeding length. Each genus comprises but one species.

Of the first genus (*Polytelis*) the "Rock-pebbler," or "Black-tailed Parrakeet," is the representative. It feeds on the seeds and honey obtained from the flowers of the eucalypts. The prevailing body colour is rather shabby yellow, varying to a brighter colour, and relieved again by a touch of yellowish green on the shoulders, and a splash of red on the tail coverts. The characteristically long tail is a dark green. It is a strong flier, as its general appearance undoubtedly indicates.

The second genus (*Spathopterus*) is represented by the Alexandra Parrakeet (*Spathopterus alexandræ*), of which little is known. It was named after our present Queen, then the Princess of Wales. The third and last genus (*Ptistes*) of the sub-family is one remarkable for largely-developed wings and laboured flight. These

Digitized by Google

peculiarities give them the generic name of *Ptistes* or Winnowers, The number of species is small, and they are exclusively Australian, with one exception, which inhabits the islands Northwards. The plumage is remarkably handsome. Of the three known species, one is found in the Northern parts of the State. No written description can adequately convey an idea of such lovely forms, where vivid and myrtle greens, metallic blue, scarlet, and black meet in brilliant combination.

The second sub-family of the Parrots are the Parrakeets, which are a handsome and widely-distributed group throughout Australia. These, like the Cockatoos, have soft knob tongues, in contradistinction to the brush tongues of the Lorikeets. Seeds and fruit form their diet, and there cannot be much doubt that they have the sense of taste highly developed. The power of flight is a restricted one in comparison with that of swift-flying Lorikeets and the heavier-flying Cockatoos and Winnowers.

Of the genus *Platycercus*, Western Australia possesses three species. The one best known of the three in the Southern latitudes is the "Western Australian Rosella," or "Yellow-cheeked Parrakeet" (*Platycercus icterotis*). Rosella, by the way, is a corruption of "Rosehill," a place near Sydney where, it is said, the first member of the genus was discovered, or where this bird was plentiful. It is not difficult to follow that the parrakeets, abundant at Rosehill, should be dubbed "Rosehillers," and then afterwards the name should be changed into the more euphemistic and apparently feminine diminutive. The Western Australian Rosella is a common bird in the forests and open lands. Its deep red head and breast, yellow cheeks, black and green back, and blue shoulders, claim for it the designation of beautiful. In breeding season, pairs will engage in a battle royal for a tree offering special facilities for nesting. In these battles the pairs engage simultaneously and with much viciousness, and with considerable vocal chatter. After each engagement the pairs repair to the neighbouring branches for breathing time, and return again with renewed vigour until the vanquished ones fly off. Another beautiful member of the genus is the "Smutty Parrakeet" (*Platycercus browni*). Resembling the *Platycerci* is an allied form, the Red-capped Parrakeet (*Porphyrocephalus spurius*), which is abundant throughout the forests of the Southern districts. It frequents mostly the high red gum trees, where, hidden amongst the foliage of the topmost branches, it feeds on the green seed vessels of those trees. Its dull red head, verditer green throat, and dull blue breast distinguish it from other forms. It is purely Western Australian.

The parrakeet most abundant and ubiquitous in the Southern portions of the State, and consequently the best known, is the "Twenty-eight," or "Yellow-collared Parrakeet" (*Barnardius semitorquatus*). In the spring time on the coastal scrub hills of the South-West they appear in thousands. A closely allied form, found also in Western Australia, is the "Port Lincoln Lory," or the "Yellow-banded Parakeet." It resembles the "Twenty-eight

Digitized by Google

almost every respect, a question of colour disposition distinguishing them. A Northern form of the latter species occurs in *Barnardius occidentalis*. Another genus (*Psephotus*) comprises four species, including one of the most charming of all the parrot family, the "Many-coloured Parrakeet" (*Psephotus multicolor*). The Grass parrakeets (*Neophema*) occur in Western Australia, and include the singular "Rock Parrakeet" (*Neophema petrophila*), found at Rottnest Island and along the rock-bound coast in the South-West, where it breeds in the precipitous cliffs.

One of the most charming of cage birds is the loving little creature called by the various vernacular names of "Shell Parrot," "Zebra Parrot," and "Lovebird," *Melopsittacus undulatus*. It is always regarded as the very embodiment of domestic felicity, evidenced by its openly-exhibited and whole-souled devotion one to the other during courtship and the rearing of the young. As the bird is so common in captivity, description is unnecessary.

It is difficult to imagine a member of the parrot family that does not rest in trees, that does not congregate with its own in flocks, that has flesh equal in quality to that of a quail, and that leaves a body scent as strong as a game bird; but such a parrot exists, and the Ground Parrakeet (*Pezoporus formosus*) is that unique form. The Parrakeet in question is a purely terrestrial bird, living entirely in the coarse grass and herbage, and when flushed seeking refuge again under similar cover. The thick strong, prehensile legs of the Lorikeets and other members of the family are absent, and are replaced in this genus by thin, long legs, specially adapted for running. For further and better protection, Nature has provided it with a protective dark grass green coat, with the undersurface mottled with yellow and black. The birds are generally distributed throughout Australia.

Another member of the Parrakeets, and quite as singular in many respects as the preceding, is the "Night Parrakeet" (*Geopsittacus occidentalis*). It is also a ground-dweller. In addition to its other peculiarities, the "Night Parrakeet" is, as its vernacular name implies, nocturnal in habit.

It conceals itself during the day in caves and recesses in rocks. Its whole body plumage is dark grass-green, blotched with black and greenish yellow, the under-surface being lightened with yellowish green.

Columbæ—Pigeons and Doves.

The above order has been divided into five families, comprising the "Fruit Pigeons" (*Treronidæ*), the "True Pigeons" (*Columbidæ*), the "Ground Pigeons" (*Peristeridæ*), the "Crowned Pigeons" (*Gouridæ*), and the "Tooth-billed Pigeons" (*Didunculidæ*).

Of the above families, we have representatives of but two, the Fruit Eaters and the Ground Pigeons. The True Pigeons are absent, as also are the Crowned Pigeons (which are strictly confined to New Guinea), and also the Tooth-billed Pigeons.

Digitized by Google

The Fruit-eating Pigeons in Western Australia are divided into two sub-families (*Ptilopodinæ* and *Carpophaginæ*), each comprising a single genus and species. Of the former sub-family, the "Rose-crowned Fruit Pigeon" (*Ptilopus ewingi*) is, so far as Western Australia is concerned, the sub-family, genus, and species in one. The species under notice has its habitat in the extreme North of the State.

Its various body tints and shades, consisting of rose pinks, bright yellows, pale and green-tinted greys, orange reds, purple, bronzes, bright greens, olives, and burnt siennas are a thing of beauty, and undoubtedly uphold its reputation for columbine beauty.

Of the second sub-family, the *Carpophaginæ*, we have the White Nutmeg Pigeon (*Myristicivora spilorrhoa*). It also is a denizen of the extreme North; but as regards its tints and the shades of its body colouring, it falls far short of the species just described. Its colour is cream white, relieved with dark grey on the wing coverts and tail. The bird owes its vernacular name to its almost exclusively passing its life in the tops of the wild nutmeg tree (*Myristica*), the fruit of which forms its staple food.

Of the "Ground Pigeons" (*Geopelia*), we have three species, *G. humeralis*, *tranquilla*, and *cuneata*, known in the vernacular as the "Barred-shouldered," the "Graceful," and the "Ground Doves." These, however, must not be confounded with the "Turtle Doves" of the Old World (*Turtur*).

The members of this sub-family are remarkable for their graceful, elegant appearance, and their fearlessness of man. All three species are found either in the Northern or interior parts of Western Australia, but mostly in the Northern latitudes. Owing to the exertions of the Zoological Gardens Committee, one species, the Barred-shouldered Dove, is a familiar form about South Perth. It has readily adapted itself to its new environments, where almost every household is visited by these fearless simple birds, and every local villa shrubbery is commandeered by a pair of birds for nesting. They also build in the spearwood and acacia scrubs in the vicinity. Material increase in numbers is, however, checked by the domestic cat and by pea and air rifles in the hands of ruthless budding scions of respectable local families.

The remaining sub-family of the Ground Feeders are the well-known "Bronzewing Pigeons," who receive their popular name from the clearly-defined patch of bronze which adorns the wing coverts. Almost every Australian knows either one or other form of the Bronzewing. The Bronzewing (*Phaps chalcoptera*) is found not only in Western Australia, but all over the Continent of Australia, where fresh water is procurable and settlement has not been too dense. Every sportsman, excluding the spurious section known as "pot shooters," meets his match in the direct strong flight of the "Bronzewing," and no bird, excepting the black duck or the snipe, tests his *skill and accuracy* more. Many years ago

Digitized by Google

the Bronzewing was very plentiful on the Swan and Canning Rivers and in the Eastern agricultural districts, but close settlement has pressed the birds farther afield. The Brush Bronzewing (*Phaps elegans*) is also well distributed over the Continent. On the coastal scrubs of the South-West it is still very plentiful. Like the Bronzewing, it is a strong, straight flier.

Closely allied to the Bronzewing is another species, found in the Northern parts of the State, namely, the "Harlequin Bronzewing," or "Flock Pigeon." It is smaller than the common "Bronzewing," but what it lacks in size is amply compensated for in its resplendent plumage. The soft fawn-grey tints of the breast and under parts, relieved by its sienna-brown upper surface, make it a striking bird. As the alternative popular name given above implies, it is gregarious, and this quite in contradistinction to the Brush Bronzewing, which is usually found singly.

Another singular form found in the far North is a Rock Pigeon (*Petrophassa albipennis*), which, as both its vernacular and its generic names indicate, is a dweller among the rocks. It is found on the rough sterile sandstone tracts of rocky country of the North-West coast. It must not, however, be confounded with the "Blue Rock" (*Columba livia*) which is not an Australian form.

"Smith's Partridge Bronzewing" (*Geophaps smithi*) is also an inhabitant of the Northern parts of the State and of the interior. When flushed, it rises like a quail, and with the same wing-noise.

Another interesting genus of the Bronzewing family is the "Plumed Pigeon" (genus *Lophophaps*), of which there are three species, all found in the Northern part of the State. They are distinctly terrestrial in habit, and invariably prefer running to flight. In general appearance and habits they much resemble the partridge and the quail. As their vernacular name implies, they are crested, and this characteristic, combined with the light and dark russets of their body, makes them readily distinguishable.

The remaining species of the Western Australian Bronzewings is that known as the "Crested Bronzewing" (*Ocyphaps lophotes*), which also is found, so far as this State is concerned, in the Northern parts and the interior. Perhaps no better bird is known to pioneers and bushmen. It has a peculiar habit of wheeling around a pool or soak in flocks, and suddenly descending and drinking.

Apart from the pigeons just briefly noticed, Queensland possesses many forms, particularly of the Fruit-eating Pigeons, which have not, so far, been recorded in Western Australia. As the Northern parts of this State are more closely searched, doubtless many of those unrecorded forms will be discovered. It is almost safe to speculate that such gorgeous forms of the Fruit Eaters, as the Red-crowned, the Purple-crowned, and the Purple-breasted Fruit Pigeons, will be recorded, including also the only Australian forms of the Wood Pigeon (*Columba leucomela*). The Little Green Pigeon (*Chalcophaps chrysochlora*), so common about Rockhampton,

Digitized by Google

Queensland, is absent from Western Australia, and so is the singular "Wonga Wonga" Pigeon (*Leucosarcia picata*), common in the forests of Gippsland, Victoria.

Gallinæ—Game Birds.

The vernacular name of this order is certainly misleading. For while the *Gallinæ* include Grouse, Capercailzies, Partridges, Pheasants, and Jungle Fowl, and many other kindred families not indigenous to Western Australia, it does not include many birds locally known as "Game"—Such as Ducks, Plovers, Bustard Quails, Quails, and Pigeons.

Excluding the Bustard Quails or *Hemipodes* (which are included according to the old classification in a separate order), we have only two representative game birds—one a brown quail *(Synœcus Australis)* and the other the Gnou or Mallee Fowl. The former, though at one time generally distributed, is, owing to the ravages of the domestic cat of the settler, rarely found, and then only in secluded places.

The latter is remarkable for the peculiarity of the method in which it constructs its nest and in the hatching of its young. The nests are composed of vast conical mounds of earth, in the centre of which deposits of moist leaves and *débris* are placed. The eggs, after being laid, are placed into the moist deposits which, with the aid of the sun, act as incubators. The birds raise these mounds by throwing up the earth backwards with the foot. The soil appears to be grasped and thrown, not scratched after the manner of a domestic fowl. When one foot has been used for a time, the other is then used, evidently for relief. In dry weather the mound is opened at the top to let in the sun. On the approach of rain it is closed, and the top brought to an apex. The following are the dimensions of a mound lately inspected near Cape Mentelle. The lower base is not mathematically circular, natural obstacles frequently spoiling the possibility of its being so, hence the apparent disparity between the overall diameter given and the circumference—

MEASUREMENTS OF GNOU'S NEST, 27TH DECEMBER, 1901.

Apex to base (North)	4ft. 2in.
" " (South)	5ft. 9in.
" " (East)	6ft. 0in.
" " (West)	4ft. 9in.
Nest Cavity (North to South)	5ft. 4in.
" (East to West)	5ft. 8in.
Circumference (extreme edge)	54ft. 0in.

(Measurements taken by A. W. Milligan and C. P. Conigrave.)

Hemipodii—the Three-Toed or Bustard Quails.

This order comprises the Three-toed, or Bustard Quails, and the Wanderers. They are separated from the true Quails and their allied genera. Mr. Ogilvie-Grant, the greatest authority on game birds, places them between the gallinaceous birds and the rails, their characteristics showing a marked affinity to each. In India the Bustard Quails *are called "Button Quail."*

Digitized by Google

In Western Australia we have four species, the most common of which in the Southern latitudes is the Painted Quail (*Turnix varia*). They are procurable almost anywhere in the sandy banksia country or the sterile iron-gravel ridges. They cannot, however, be said to be numerous, as rarely more than a pair are seen together, except after the breeding season, when a bevy of four or five may be flushed. The young birds just from the shell have been secured on the Canning River, about four miles from Perth. The female bird—a peculiarity of the order—is much the larger. The male attends to the hatching of the eggs and the rearing of the young.

They are early breeders, young birds having been obtained in August. Owing to a decided preference to rely upon their running powers, they are difficult to flush, but when flushed they fly with great speed and offer excellent sport.

The call is a trumpeting coo, not unlike the call of a male pigeon, much modified and subdued.

In the Northern parts of the State are found three other species—the Chestnut-backed Bustard Quail (*Turnix castanonota*), the Little Bustard Quail (*Turnix velox*), and the White-bellied Quail (*Turnix leucogaster*). The latter species is, however, doubtful.

The Collared Plain Wanderer, which so much resembles a miniature bustard, and which is fairly common in Victoria and New South Wales, is not found in Western Australia.

Fulicariæ—The Rails and Waterhens.

The order comprises the True Rails (genus *Rallus*), the Land Rails (genus *Crex*), the Little Crakes (genus *Zapornia*), the Spotted Crakes (genus *Porzana*), the Moorhens (genus *Gallinula*), the Purple Gallinules (genus *Porphyrio*), and the Coot (genus *Fulica*).

In regard to the True Rails, Western Australia is not represented. Similarly with the Land Rails. Of the Little Crakes, we have two, *Porzana palustris* and *P. tabuensis*. The former is found in the reedy swamps around Perth, but it cannot be said that it is anywhere plentiful.

Of the Moorhens we have one species, *Gallinula tenebrosa*, the Black Moorhen.

Of the Purple Gallinules, we have two, *Porphyrio bellus*, misnamed in the vernacular list of the names of Australian birds as Blue-bald "*Coot*," and *Porphyrio melanonotus*, named in the same list as the Bald "*Coot*."

The local name "Gallinule" is distinctly preferable. The Gallinules, which are simply large rails, are to be found in many of the large swamps. They are readily distinguishable by the dark blue and black colouring of their body plumage, and (when they are not conscious of observation) by their jaunty, jerky carriage and the flicky movement of the tail. They are rendered more conspicuous, however, by their bright red-coloured frontal shield. As

Digitized by Google

food, the breasts form excellent eating, but for the purposes of sport they are too slow on the wing. *Porphyrio bellus* is a purely Western Australian form.

Allied to the True Rails is a genus found in Western Australia, *Hypotænidia*, comprising two species, namely, *H. phillipinensis* and *H. brachypus*, the Pectoral Rail and the Slate-breasted Rail respectively. Between the Spotted Crakes and the Moorhens is another purely Australian genus, comprising one species only, *Gallinula tenebrosa*, the Black-tailed Native Hen. In the year 1886 vast numbers of these birds invaded the Geraldton district, doing great damage to the crops. In the same year there were numbers to be found at South Perth and on the Swan River, just above the Bunbury Bridge. The sustained drought in the interior evidently was the cause for the visitation to the coast. Since that year the birds have not been recorded in the localities named. Although the bird resembles externally a large bantam hen, nevertheless the vernacular name is ornithologically inapt and misleading.

Of the Coots proper (*Fulica*) we have but one species (*Fulica australis*). They are readily recognisable by their cinder-grey plumage and whitish frontal shields.

The Coots may be distinguished from all other members of the order by the presence of scalloped lobes on the toes.

As a food they are edible, and when other game is scarce, they are welcome; although, from a sportsman's point of view, they cannot be regarded as good sport.

Alectorides—the Crane-like Birds.

This order, according to the old classification, includes among others the families of the Cranes (*Gruidæ*) and Bustards (*Otididæ*).

A true crane is not found in Western Australia, the "Native Companion," being a member of a genus (*Antigone*) closely allied to the true Cranes. The Herons must not be confounded with the Cranes. They belong to different Orders of birds. Two other forms of the genus *Antigone* are found in India and Burma respectively.

Of the second section of the order, the Bustards, the "Wild Turkey" of the settlers, is the only member.

The so-called wild turkeys are very abundant in the Western coastal regions. Owing to the wariness of the birds, much address is required in shooting them. As a food they are excellent, although inclined to be dry. It is not uncommon to find birds weighing as much as 20lbs.

Limicolæ—the Plovers.

This very interesting order embraces among other families the Thick-knees (*Œdicnemidæ*), the Coursers and Pratincoles (*Cursoriidæ*), the Plovers (*Charadriidæ*), including in the latter the sub-families of Turnstones (*Arenariinæ*), the Oyster-catchers (*Hæma-*

Digitized by Google

topidinæ), the Dotterels, the Masked Plovers and Sand-dotterels (*Charadriinæ*), the Stilts and Avocets (*Himantopidinæ*), the Sea-curlews, Whimbrels, Godwits, Sandpipers, and Greenshanks (*Totaninæ*), and the Sanderlings, Stints, and Snipes (*Scolopacinæ*).

The Thick knees or Stone Plovers form a connecting link between the Bustards and Plovers. We have not, however, a true Thick-knee (*Œdicnemus*). Our Stone Plover (*Burhinus grallarius*) is an allied form and is a purely Australian one. It is commonly called the "Curlew" by the settlers, owing doubtless to the weird cry, resembling its erroneous name, which it utters at night. The true curlew is referred to hereafter, and is quite a different bird.

Another allied genus contains one species (*Orthorhampus magnirostris*), the Long-billed Stone Plover, which is readily distinguishable by its long and large mandibles. This genus is almost exclusively confined to Australia.

Of the second family of birds, we have not a true Courser, but of the allied genus, the Pratincoles, we have one species (*Glareola orientalis*). Allied to the latter birds is another genus (the members of which are distinguishable by their longer legs), which is almost purely Australian (*Stiltia isabella*).

Of the Turnstones we have but one species (*Arenaria interpres*), found not only in Europe, but nearly all over the world. The Turnstone owes its name to its habit of turning over the pebbles on the beach in search of food.

The next sub-family, the Oyster-catchers, taken altogether, embrace one genus and twelve species, two of which latter are found in Western Australia. One (*Hæmatopus longirostris*) is confined to Australia, Tasmania, New Zealand, Chatham Islands, New Guinea, and Molucca Islands, and the other (*H. unicolor*) is exclusively confined to Australia and New Zealand.

Their glossy black, or black and white plumage, according to the species, and their long vermilion-coloured bills and purplish-red legs, make the birds conspicuous objects on the sea shore, and readily distinguishable. Of the Masked Plovers, we have the Masked Plover and the so-called Red-kneed Dottrel. Of the True Plovers we have the British Grey Plover (*Squatarola helvetica*) as a visitant. The Lesser Golden Plover (*Charadrius dominicus*), and two species of the Red-breasted Dottrels (*Octhodromus veredus* and *O. geoffroyi*) also leave Britain and winter with us. The Ringed Sand Plover (*Ægialitis hiatacola*) similarly honours us. Another of the Sand Dottrels, known as the Black-fronted Dottrel (*Ægialitis melanops*), is purely Australian, whilst another (*A. ruficapilla*) distributes its time between Australia and the intervening region North to China. The remaining one, the "Hooded Dottrel" (*A. cucullata*) is confined to the Commonwealth. *A. ruficapilla* abounds on the Western coast, on the coastal islands, and parallel coastal lakes. The Hooded Dottrel also is abundant on the sea shore, where it nests just above the high water mark. No attempt

Digitized by Google

is made to build a nest, a depression in the sand, with a few small shells added, serving the purpose.

An Australian genus closely allied to the True Plovers, and known as the Black-breasted Plover (*Zonifer tricolor*), must be added to the list.

Another purely Australian Dottrel (*Peltohyas australis*), occupying a sub-family and genus to itself, is recorded.

Of the Stilts we have one true representative in the White-headed Stilt (*Himantopus leucocephalus*), and also a true Avocet (*Recurvirostra novæ-hollandiæ*). The Avocets have remarkably long legs and bill, the latter being distinctly upturned.

Between the Stilts and Avocets occurs a purely Australian genus (*Cladorhynchus leucocephalus*), known among local sportsmen as the "Rottnest Snipe." The birds, which are always in large companies, afford good sport. They are excellent for the table. A party of eight guns recently secured 200 birds in the day. The birds were in such large companies that the members of the party had perforce to resort to "browning" when shooting.

Of the Curlews we possess two species, the "Sea Curlew" (*Numenius cyanopus*), and the Whimbrel (*Numenius variegatus*). These Curlews are the only ones strictly entitled to the name. The same name is erroneously given to the Southern Stone Plover as before mentioned. Both the Sea Curlew and Whimbrel are really inhabitants of Japan, and simply winter here. Closely allied to the Whimbrels is the "Little Whimbrel," comprised in the genus *Mesoscolopax*, and who also is a visitant from the same country.

Of the Godwits (genus *Limosa*) we have but one, the Barred-rumped (*Limosa novæ-hollandiæ*), also a visitant from Siberia.

The Green-shank (*Glottis nebularis*), which breeds in Scotland and in the islands off the West of that country, and who is but a migrant in England, also winters here. One of the Summer Snipes (*Tringoides hypoleucus*), the Sanderling (*Calidris arenaria*), both found in Britain, observe a similar seasonable change of habitat. The "Little Stint" (*Limonites ruficollis*) leaves Siberia, China, and Japan for a like purpose. The Sharp-tailed Stint (*Heteropygia acuminata*), the Curlew Stint (*Ancylochilus subarquatus*) from Siberia, the Great Sandpiper (*Tringa crassirostris*) from Siberia and Japan, and the Snipe (*Gallinago australis*) from Formosa, all make this State their winter quarters.

With regard to the last mentioned bird, the True Snipe, the statement that it has been seen near Roebourne, requires confirmation. It is unlikely that the species visits Western Australia, for this State is out of the "line of flight of migration," which undoubtedly is on the East coast of Australia. The vast desert between South Australia and Western Australia would, it is conceived, act as a bar to Westward peregrinations.

Digitized by Google

Gaviæ—Sea Birds.

Western Australia, by reason of its vast sea-board, is necessarily rich in the numbers of its sea-birds, if not in genera and species, certainly in regard to individuals. The Terns and Ternlets, Noddies, and Gulls, composing the order, number eight genera and fifteen species, included in which is the Silver Gull (*Larus novæhollandiæ*), a well-known form on the Swan River, at Perth. The Abrolhos Islands, off Geraldton, and other islands farther North are favourite resorts for most of the order.

Tubinares—Tube-nosed Swimmers.

The Storm and other Petrels, Prions, and Albatrosses, which form this order, are likewise numerous in individuals, for the reason before stated in regard to the Seabirds. The genera number thirteen and the species twenty-four. The order includes the "Short-tailed Petrel (*Puffius tenuirostris*), better known as the "Mutton-bird." The Mutton-bird is a migrant, but nests in the Southern latitudes. In the Bass Strait Islands, South of Victoria, where they resort in great numbers for nesting, they arrive simply in millions on or about the 18th November in each year. One immigration of those birds was estimated at 132,000,000. The eggs are collected for the market, and sold in many instances as hen eggs, when the latter are scarce. The young are killed and used as an article of food, the oil, which also is valuable, having been first expressed or drawn off. Of the seventeen species living forms of Albatrosses, Western Australia furnishes six.

Plataleæ—Ibises and Spoonbills.

This order contains the Ibises and Spoonbills, but so far as Western Australia is concerned, it only comprises five members altogether.

The true Ibises are represented in Western Australia by the White Ibis (*Ibis molucca*), a species also found in the islands North of Australia and in New Guinea. The Sacred Ibis (*Ibis Æthiopica*), familiar by reason of its connection with Egyptian lore, does not occur in Australia; it belongs to East Africa and South-West Asia, where in many parts it is plentiful.

Of the Glossy Ibises (*Plegadis*) we have a species (*P. falcinellus*) that is remarkable, inasmuch as it is found in nearly every part of the Old World.

Allied to the true Ibis we have a purely Australian genus, embracing one species only (*Carphibis spinicollis*), or the "Straw-necked Ibis." A close examination of the bird will show how obviously appropriate is its specific name.

The second section of the Order Plataleæ is the Spoonbills, a family of birds remarkable for its large spoon-shaped mandibles. Western Australia has one true spoonbill (*Platalea regia*), vernacularly named the "Black-billed Spoonbill."

Digitized by Google

We have also another genus, which is indigenous, and comprises one species (*Platibis flavipes*), the Yellow-billed Spoonbill.

Herodiones—Herons and Storks.

This order, which, according to the old classification, only comprised the Herons (*Ardeidæ*) and the Storks (*Ciconiidæ*), is only sparsely represented in the State.

The Purple Herons (*Phoyx*) and the Grey Herons (*Ardea*) are not found in Western Australia.

The Great White Herons (*Herodias*) are represented by *Herodias timoriensis*, commonly designated the "White Egret," a bird whose range extends as far as China and Japan.

Of the Little Egrets (*Garzetta*) Western Australia is represented by *Garzetta nigripes*, an allied species to the Old World form *Garzetta garzetta*. The Little Egret is also found in Java and the Moluccas. Of the Night Herons (*Nycticorax*) we have one representative (*Nycticorax caledonicus*) popularly known as the "Nankeen Night Heron." It breeds, among other places, in colonies in the cliffs on the rocky islets. The cliffs of Bird Island near Fremantle are a favourite nesting place. In the Old World the representative species build in trees.

Three other genera not represented in Europe occur here. Mesophoyx, comprising one species (*M. plumifera*), known as the "Plumed Egret"; Notophoyx, comprising two species, the White-necked Heron (*N. pacifica*), and the White-fronted Heron (*N. novæ hollandiæ*); and Demiegretta, comprising one species, the Reef Heron (*D. sacra*), The White-fronted Heron is a familiar form in the closed area near Perth, on the Swan River, where it may be seen wading in the shallows. By most persons they are called "cranes," which, needless to say, is a misnomer.

Of the Bitterns, we have three genera and three species. The True Bitterns, which are almost cosmopolitan, are represented by *Botaurus pœciloptilus*. During the nesting season in the Spring months of the year the "booming" of this bird may be heard in almost every secluded swamp. Of the Little Bitterns, we have but one of the ten known species, namely, *Ardetta pusilla*. The Little Bitterns are distributed almost over the entire globe.

In addition to the above we have *Dupetor gouldi*, the Black Bittern, a member of a genus not found in Europe.

We have not a true stork, but only an allied form in the Jabiru (*Xenorhynchus asiaticus*), which is a distinctly handsome bird, only found in the North, and ranging thence to the Indian Peninsula and Burma.

Steganopodes—Pelican-like Birds.

In this Order are comprised the Pelicans proper, the Cormorants and Shags, the Gannets, the Frigate-birds and the Tropic Bi-

Digitized by Google

Pelicans are not found in England. In Western Australia one species only is found, (*Pelecanus conspicillatus*). Colonies of these birds may be observed at any time on the Swan River at Perth. They are also numerous on the Southern estuaries.

The Cormorants (*Phalacrocorax*) are represented by five species, one of them the "Black Cormorant" (*P. carbo*), being found in Britain as well as in Australia.

One of the most interesting sights on the Swan River is the beating of the shallows by troops of these birds for small fish. The Little Cormorant (*P. melanoleucus*), more commonly known as the "Shag," frequents the Swan River and Southern estuaries in great numbers, leaving them only during the months of October, November, and December for the coastal swamps and the islets for breeding.

Cormorants may easily be distinguished from the Shags by the larger size of the former, and the colouring on the back being blue-black instead of greenish. The fact, too, that Cormorants have 14 tail feathers, and the Shags only 12, forms, on close examination, another means of identification.

No True Gannets occur in Western Australia, but an allied form (*Sula serrator*) is found in the South-West, and two other species (*S. cyanops*), the Masked Gannet, and (*S. sula*), the Booby, on the North coast, while another allied form is the "Darter" (*Plotus novæ-hollandiæ*), which is common to New Guinea, Australia, and New Zealand. The last-mentioned bird frequently builds with the Cormorants in their nest-colonies. The "Darter" also bears the name of the "Snake Bird," presumably in consequence of its long, sinuous neck and attenuated head, resembling a snake. The Frigate Birds and the remarkable Tropic Birds are found in the tropical seas and on the contiguous shores of Australia; they are essentially inhabitants of tropical regions.

Pygopodes—Diving Birds.

This order of aquatic birds is represented in Western Australia by three species, which are embraced in one family. They are known under the vernacular names of "Grebes" and "Dabchicks." They are distinguished externally by their obsolete tail and lobed toes. The Horned Grebes and Eared Grebes of Europe have not any kindred genera or species in Western Australia. The Little Grebes are cosmopolitan, and are represented in China, India, the Philippines, the Moluccas, Madagascar, and America, as well as in Australia. The common form seen on the Swan River at Perth swimming about in small companies is the "Dabchick," or "Hoary-headed Grebe" (*Podicipes poliocephalus*). When alarmed, every member of the company simultaneously vanishes under the water, and on coming to the surface again the same performance is immediately repeated, unless the cause of alarm is apparently outside danger's limits.

Digitized by Google

Another member of the genus which locally shares the vernacular name of "dabchick," in common with the preceding one, is the "Black-throated Grebe (*P. novæ-hollandiæ*).

The third species is the remarkable Grebe known as the "Tippet Grebe" (*P. cristatus*). It is the largest of the genus, having a total length of two feet, and is the most distinguished in appearance. Two black plumes, which spring from the forehead, and incline upwards and backwards, give it a distinctly mephistophelian look. A frill or collarette of black, white, and chestnut, ornaments the sides of the throat and head, and makes it at all times readily identifiable. The bird is identical with the Tippet Grebe of Britain. Some recent writers would place this bird in another genus of this family, and call it *Lophæthyia cristata.*

Impennes—"Penguins."

Western Australia is only favoured by one member of this order, the Little Penguin (*Eudyptula minor*).

Colonies of these upright grotesque little fellows with their light blue coats and white pinafores are abundant on the islets off the Southern and South-Western coasts.

Phoenicopteri—The Flamingoes.

This Order of birds is not represented in the Australian region.

Chenomorphæ—Geese, Swan, and Ducks.

This Order of birds is fairly well represented in Western Australia, and is remarkable for many of its singular and purely Australian forms. Australia does not possess a true goose, but an allied form known as the "Pied goose" (*Anseranas semipalmata*), which is purely endemic so far as Australia is concerned, and occupies a sub-family entirely to itself.

The other forms, known as the "Green Goose teal" (*Nettopus pulchellus*), the "Cape Barren Goose" (*Cereopsis novæ-hollandiæ*), and the "Maned Goose" (*Chenonetta jubata*), are also endemic, and possess a like distinction, that of the whole and sole representation of a sub-family. The Maned Goose is the "Wood duck" of the colonists, but the latter vernacular appellation is obviously a misnomer.

The State is not represented by a True Swan (*Cygnus*), and it perhaps may be disappointing to know that the well-known Black Swan (*Chenopis atrata*) is only an allied form.

Western Australia, however, is more fortunate in the ducks, for it has a true duck (*Anas superciliosa*), the "black duck" of sportsmen. Of the Shield-ducks, the State has a single species (*Tadorna radjah*). Of the Ruddy Shield-ducks, it has on

Digitized by Google

(*Casarca tadornoides*) commonly known as the "Mountain Duck." Of the "Shovellers" there is one species (*Spatula rhynchotis*), commonly known as the "Blue-wing." None of the Widgeons (*Mareca*) are found in Western Australia, but two species of Teal (*Nettium gibberifrons*, and *N. castaneum*) are found.

The local species of teal are remarkable for their assumption of a "post nuptial plumage" at a certain season of the year. Closely allied to the Australian representative of the Shovellers (the Blue-wing), is the "Pink-eared Duck" (*Malacorhynchus membranaceus*), erroneously called the "Widgeon" by local sportsmen, and again closely allied to the latter is the "Freckled Duck" (*Stictonetta nævosa*).

The Diving Ducks (*Sub-family Fuligulinæ*) are represented by the Pochards (*Aythya*), the Blue-billed ducks (*Erismatura*), and the Musk ducks (*Biziura*).

Of the Pochards, Western Australia has one (*Nyroca australis*), commonly known as the "White-eyed Duck;" and also one Blue-billed Duck (*Erismatura australis*). The remaining genus (*Biziura*) is purely Australian, and comprises but one species (*B. lobata*), locally known as the "Steamer" or "Musk Duck." These birds are abundant on the Swan River, on the line of lakes parallel with the West Coast and on the estuaries, and in fact every small swamp has its pair of birds. At certain times during the year the "ponk" of the "Steamer" duck is frequently heard. Local opinion supports the notion that the bird makes the noise by striking the water quickly with one of its feet. Better observation, however, points to the fact that the male bird makes the sound whilst immersing its head in the water, and at the same time striking the water with its wing, its feet, and its spiny tail. The note when uttered above the water is weak, and very much less resonant. The male bird utters the note when disporting himself before the females, and the sound and action are evidently used for the purposes of attracting the latter. Such familiar Old World forms as the Scaup ducks, the Golden-eyed ducks, Eider ducks, Scoters, Smews, and Mergansers, are wanting in Western Australia.

The birds so far mentioned all belong to the sub-class *Carinatæ*, those having a "keeled" breast-bone. There now remains the sub-class *Ratitæ*, in which there is no keel to the breast-bone, and but a rudimentary "wishing-bone" or "merry thought": they are incapable of flight, but can run swiftly. This sub-class is represented in Australia by the Cassowary and Emu, of which only the latter is to be found in this State. Whether there be two living species of Emu, *Dromæus novæ-hollandiæ*, and a spotted Emu, *D. irroratus*, confined to Western Australia, is still a disputed question, for many authorities hold that the "spottiness" is merely an accidental variation, and of no specific value, and that some young "spotted" birds have grown up into ordinary emus. This is a point well worthy of attention.

Digitized by Google

Addenda to List of Western Australian Birds

Published in the "Year Book," 1898-99.

The six new species marked x have been discovered since, while the occurrence of the remainder has been verified:—

Passeriformes.

Chibia bracteata [Gld.], "Drongo," N.
Graucalus hypoleucus [Gld.], "White-bellied Cuckoo-shrike," N.
Smicrornis brevirostris, "Short-billed Tree-tit."
Malurus callainus [Gld.], "Turquoise Wren."
x Malurus edouardi [Camp.], "Black and White Wren," N.W.
x Sphenura litoralis [Milligan], "Bristle Bird," S.W.
x Eremiornis carteri [North], "Carter's Desert-bird," N.W.
x Amytis gigantura [Milligan], "Western Grass Wren," C.
x Amytis housei [Milligan], "Black Grass-wren," N.
Eopsaltria pulverulenta [B'parte], "White-tailed Shrike Robin," N.W.
Pachycephala fretorum [De Vis], "Torres Straits Thickhead," N.
Plectrorhynchus lanceolatus [Gld.], "Striped Honey-eater," S.W.
x Mirafra woodwardi [Milligan], "Bush Lark," N.W.
Helodromas ochropus [Linn], "Green Sandpiper."
Sula cyanops [Sandev.], "Masked Gannet," N.W.
Sula sula [Linn], "Brown Gannet" [Booby] N.W.

CLASS III.—REPTILIA.

The Reptiles are in many essential features of their organisation very closely allied to the birds; in fact, Huxley classed them together as *Sauroptida* in his second Division of the Animal Kingdom, but the differences are so marked that they are rightly placed in a distinct class.

They are cold-blooded animals; that is to say, their blood is but slightly warmer than the external temperature of their habitat. The heart consists of three cavities, two auricles and one ventricle, whereas in the warm-blooded animals, Mammals and Birds, that organ has two ventricles as well as two auricles.

The normal temperature of man is 98½°, of the higher mammals from that to 104°, but in the lower forms much less; thus the temperature of the Ornithorhynchus is only 77°, of the Echidna 86°, while the marsupials vary from 93° in the Wombat to 98° in the Kangaroo. The temperature ranges from 105° to 111° in the Carinatæ, but in the less highly organised birds a similar difference is noticed; for in the Ostrich the blood heat is only 99°, and in the emu, according to the observations of Mr. E. A. Le Souef, the Director of the Perth Zoological Gardens, it is 103°.

In the Reptilia the temperature is but two or three degrees above that of the medium in which they live; that is to say, of the surrounding air or water.

Reptiles are invariably provided with an epidermic (*epi*, upon; *derma*, the true skin) clothing of scales, which, not being part of the dermis or *true skin, can be periodically* shed, as in the snake

Digitized by Google

or it may be hard and thick as in the tortoise, or tough as in the crocodile. They are all oviparous, but many are what is termed ovo-viparous; that is to say, the eggs are hatched on or before being laid.

About 4,000 species of living Reptiles are known, and these belong to four of the eleven orders into which the Class is divided. The classification at first sight may seem anomalous, for the external appearance is often very deceptive; the slow-worm and lizard are nearly related, and both are more closely connected with the snakes than with the crocodiles, although to a casual observer the lizards and crocodiles would appear to approach most nearly. The other seven orders are extinct, but a brief mention is made of them in order that the position of living reptiles in the scale of Nature may be better understood.

They are most numerous in the Tropics, and entirely absent from the Arctic and Antarctic regions. The oldest known reptiles date back to the Permo-Carboniferous formations.

SYSTEMATIC ARRANGEMENT OF THE CLASS REPTILIA.

Order I.—PTEROSAURIA: Winged Lizards.
II.—CROCODILIA: Crocodiles and Alligators.
III.—DINOSAURIA.
IV.—SQUAMATA: Snakes and Lizards.
V.—RHYCHOCEPHALIA: Tuatera.
VI.—PROTEROSAURIA.
VII.—ICHTHYOSAURIA.
VIII.—CHELONIA: Tortoises and Turtles.
IX.—SAUROPTERYGIA.
X.—PLACODONTIA.
XI.—ANOMODONTIA.

ORDER I.—PTEROSAURIA.

The Winged-Lizards are now entirely extinct, though in the Mesozoic Period they were abundant, and of great size, for some found in the chalk had a spread of wing of from 18 to 20 feet.

ORDER II.—CROCODILIA (CROCODILES).

In this Order the teeth are implanted in sockets, not as in the other living reptiles, in which the teeth are grown to the bone of the jaws.

The Crocodiles are distinguished from the Alligators by having the fourth lower tooth passing into a notch of the lateral edge of the upper jaw. The former are restricted to the Old World, the latter, with one exception in China, to the New World.

This Order first appeared in the Cretaceous rocks of North America.

ORDER III.—THE DINOSAURIA (*deinos*, terrible).

Numerous remains of these extinct reptiles have been found in the Jurassic and Cretaceous formations of both hemispheres. Some of them rivalled the whales in size.

Digitized by Google

ORDER IV.—SQUAMATA (*squama*, a scale).

This Order contains the true Lizards, the Chamæleons, and the Snakes. The former appeared in the Cretaceous strata, but the snakes not until Tertiary times. Of the 1,600 species of recent snakes known, about 30 have been noticed in this State, the most common being one of the Pythons (*Morelia variegata*), the Carpet Snake, which unfortunately is being ruthlessly destroyed, although it is not poisonous; and it is a useful friend to the agriculturist, as it feeds on the small mammals and birds which injure their crops.

There are very few species of poisonous snakes in the State, and the statistics of the Registrar General show that only one death from snake-bite has been noted since medical returns have been kept. It is not easy from external appearance to distinguish between the poisonous and non-poisonous kinds, as at least one family of the former have assumed the head-forms of the harmless varieties. The non-venomous snakes have generally two rows of short-pointed, incurved teeth in the upper jaw, and one row in the lower; but the venomous have, in addition, a pair of longer-grooved or perforated fangs, connected with a duct which carries the fluid from the poison glands. This gland is compressed at the moment the snake opens its mouth, and the poison forced through the tooth.

Several species of Typhlopidæ, the Burrowing or Blind Snakes, occur in this State. The Sea-Snakes, of which some species are found in the North-West, pass their whole life in the sea. They are very poisonous.

LACERTILIA—LIZARDS.

This sub-order contains about 2,000 species, of which more than 100 occur in the State. The snake-like Lizards, Pygopodidæ, are often mistaken for snakes, as they have no fore-legs, and only minute rudimentary hind-feet, which are not easily seen. All the Australian lizards are harmless. The most conspicuous are the Lace Lizard (*Varanus varius*), and the Stump-tailed Lizard (*Trachysaurus rugosus*). These are frequently, but erroneously, termed Iguanas, for those are exclusively American. The Frilled Lizard (*Chlamydosaurus kingii*) has an extensive fold of skin round its neck, which it erects when startled. *Moloch horridus*, the York or Mountain Devil, is a small lizard never exceeding eight inches in length, which lives on flies and other insects, is covered with tubercles and spines, and, notwithstanding its name and appearance, is perfectly harmless.

ORDER V.—RHYCHOCEPHALIA.

This order, of which fossil forms occur in the Permian and subsequent formations, is only represented by one living species, the Tuatera of the Maories.

ORDER VI.—PROTEROSAURIA.

An extinct reptile *of the Permian System.*

Digitized by Google

ORDER VII.—ICHTHYOSAURIA.

The Fish-Lizards first appeared in the Upper Trias; they were most abundant in the Lias, and finally became extinct in the Chalk. Many of them attained an enormous size.

ORDER VIII.—CHELONIA (*Chelone*, a tortoise).

The Tortoises and Turtles are distinguished from the other Reptiles by having a more or less bony case or "shell," which encloses the body, and into which most of them can withdraw their heads and limbs. They are divided into four groups: 1, the Sea Turtles; 2, the Fresh-water Turtles; 3, the Fresh-water Tortoises; and 4, the Land Tortoises. The turtles have their limbs in the form of swimming paddles, while the tortoises have feet, furnished with short nails, suitable for progression on the land. They have the dorsal vertebræ (the back-bone), with the exception of the first, immovably connected together; and the ribs are very wide and flattened, so that they form a solid case.

Their earliest fossil remains are found in the Permian System. The giant fossil tortoise of India reached a length of 13 feet. A remarkable extinct form has been found in the New Tertiary deposits of Queensland. It was described by Mr. A. S. Woodward and named *Miolania Oweni*, after the distinguished Professor of Comparative Anatomy. It had nine horn-like prominences in its skull, a cast of which, and also of the tail-sheath, are exhibited in the wall case. The first specimens found were considered to be the remains of an extinct lizard allied to the York Devil *(Moloch horridus)*, but of enormous size. Further researches have, however, proved it to be a Chelonian.

Of recent Chelonians, the Hawksbill Turtle (*Chelone imbricata)*, from the Lacepede Islands, the Leathery Turtle (*Dermochelys coriacea)*, from the North-West, and the Long-necked Tortoise (*Chelodina)*, are the best known.

ORDER IX.—SAUROPTERYGIA.

These extinct reptiles had no horny or bony covering, so far as is known; their geological range was from the Lias to the Chalk.

ORDER X.—PLACODONTIA (Plate-toothed).

These reptiles were formerly considered to be fish, owing to the unusual form of the jaws and teeth.

ORDER XI.—ANOMODONTIA (*anomo*, irregular).

This Order, which appears to have only existed in Permian and Triassic times, is of great interest, as it would seem to connect the Reptiles with the Monotremes.

The list following contains the names of all those reptiles that, up to the present, have been found in this State.

ORDER II.—CROCODILIA.

Crocodilus porosus (Schn.), the Northern Rivers.
Crocodilus johnstoni (Krefft), the Northern Rivers.

Digitized by Google

ORDER IV.—SQUAMATA.
Snakes and Lizards.

SUB-ORDER I.—OPHIDII COLUBRIFORMES.
Harmless Snakes.

Family I.—Typhlopidæ.—"Burrowing or Blind Snakes."

Typhlops güntheri [Ptrs.] N.
Typhlops australis [Gray] S.W.
Typhlops bicolor [Ptrs.]
Typhlops unguirostris [Ptrs], N.W.
Typhlops olivaceus [Gray], S.W. and N.W.
Typhlops nigricauda [Blgr.], N.

Family III.—Boidæ.—"Rock Snakes."

SUB-FAMILY I.—PYTHONINÆ.

Morelia variegata [Gray].
Liasis childreni [Gray], N.W. and N.
Liasis fuscus [Ptrs.], N.
Liasis olivaceus [Gray], W.
Python spilotes [Lacép], N.
Aspidites melanocephalus [Kr.], N.

Family VII.—Colubridæ.

SUB-FAMILY II.—COLUBRINÆ.

Tropidonotus picturatus [Schl.], N.W. and N.
Dendrophidæ. "Tree or Whip Snakes."
Dendrophis punctulata "The Green Tree-snake" [Gray] N. and N.W.

SUB-FAMILY IV.—HOMALOPSINÆ (VOL. III.).

Myron richardsoni [Gray] N. and N.W.
Fordonia leucobalia [Schl.] N.
Dipsadomorphus fuscus [Gray] N. and N.W.
Dipsadomorphus forstenı [D. and B.] N.W.
Dipsas ornata [Macleay] S.W.

SUB-FAMILY VII.—HYDROPHIINÆ.

Hydrus platurus [Linn.]
Hydrelaps darwiniensis [Blgr.] N.W.
Hydrelaps elegans [Gray.]
Hydrophis elegans [Gray] N.W.
Hydrophis kingii [Blgr.] "Elegant Sea Snake" N.
Distira stokesi [Gray] N.W.
Distira major [Shaw] N. and N.W.
Distira ornata [Gray] N. and N.W.
Distira grandis [Blgr.] N.
Aipysurus australis [Shaw] N.
Platurus laticaudatus [Linn.]
Platurus colubrinus [Schn.]

SUB-FAMILY VIII.—ELAPINÆ.

Pseudelaps diadema [Schl.] N. and N.W.
Diemenia psammophis [Schl.] N. and N.W.
Diemenia superciliosa [Krefft.]
Diemenia olivacea [Gray.]
Diemenia ornaticeps [Macleay] N.
Diemenia modesta [Gthr.]
Diemenia nuchalis [Gthr.] N.W.
Pseudechis porphyriacus [Shaw] "The Black Snake."
Pseudechis australis [Gray] N.
Pseudechis darwiniensis [Macleay] N.

Digitized by Google

Pseudechis scutellatus [Ptrs.] N.
Denisonia superba [Gthr.] Australia.
Denisonia coronata [Schl.]
Denisonia coronoides [Gthr.] S.W.
Denisonia gouldi [Gray] S.W.
Hoplocephalus curtus.
Hoplocephalus superbus [Gthr.]
Hoplocephalus gouldii.
Hoplocephalus coronatus.
Hoplocephalus temporalis, K.G. Sound.
Hoplocephalus minor, K.G. Sound.
Vermicella annulata, Australia.
Notechis scutatus [Ptrs.]
Rhinhoplocephalus bicolor [F. Müll.]
Brachyaspis curta [Schl.] S.W.
Acanthophis antarcticus [Shaw] N. and N.W., "Death Adder."
Elapognathus minor [Gthr.] S.W.
Rhynchelaps bertholdi [Jan.] S.W.
Rhynchelaps sexfasciatus [Gthr.] W.
Rhynchelaps fasciolatus [Gthr.] S.W.
Furina bimaculata [D. and B.]
Furina calonota [D. and B.]
Furina occipitalis [D. and B.] S.W.

ORDER IV.—SQUAMATA.

SUB-ORDER II.—LACERTILIA VERA "True Lizards."

Family I.—Geckonidæ "The Geckos."

Rhynchœdura ornata [Gthr.] N.W.
Gymnodactylus miliusii [Bory] N.W.
Gymnodactylus platyurus [White] "The Gecko."
Œlurosaurus brunneus [Cope].
Heteronota binœi [Gray] S.W. and C.
Heteronota derbiana [Gray] N.
Phyllodactylus marmoratus [Gray].
Phyllodactylus macrodactylus [Blgr].
Phyllodactylus güntheri [Blgr.] N.W.
Phyllodactylus ocellatus [Gray] N.W.
Diplodactylus ciliaris [Blgr].
Diplodactylus spinigerus [Gray] N. and N.W. and S.W.
Diplodactylus vittatus [Gray] N. and N.W. and S.W.
Diplodactylus polyophthalmus [Gthr.] N. and N.W. and S.W.
Diplodactylus pulcher [Steind] N. and N.W. and S.W.
Diplodactylus tessellatus [Gthr.].
Œdura marmorata [Gray] N. and N.W.
Œdura ocellata [Blgr.] N. and N.W.
Œdura robusta [Blgr.] N. and N.W.
Œdura lesueurii [D. and B.].
Œdura rhombifera [Gray].
Œdura verrillii [Cope].
Œdura fracticolor [De Vis] N. and N.W.
Hemidactylus brookii [Gray].
Gehyra variegata [D. and B.].
Gehyra australis [Gray] S.W.
Lepidodactylus pusillus [Cope] S.W.

Family IV.—Pygopodidæ.

Pygopus lepidopus [Lacép], a snake-like lizard with rudimentary hind feet. S.W. and N.W.
Cryptodelma nigriceps [Fisch].
Delma fraseri [Gray].

Digitized by Google

Pletholox gracilis [Cope], S.W.
Aprasia pulchella [Gray].
Lialis burtonii [Gray].

Family V.—Agamidæ.

Chelosania brunnea [Gray].
Amphibolurus maculatus [Gray], S.W. and N.W. and C.
Amphibolurus imbricatus [Peters], S.W.
Amphibolurus ornatus [Gray].
Amphibolurus cristatus [Gray].
Amphibolurus caudicinctus [Gthr.], N.W.
Amphibolurus reticulatus [Gray], S.W. and N.W.
Amphibolurus adelaidensis [Gray], S.W.
Amphibolurus pulcherrimus [Blgr.], S.W.
Amphibolurus pallidus [Blgr.], S.W.
Amphibolurus angulifer [Gray].
Amphibolurus pictus [Peters], C.
Amphibolurus muricatus [White].
Amphibolurus barbatus [Cuv.], the "Bearded Lizard."
Tympanocryptis cephalus [Gthr], N.W.
Tympanocryptis lineata [Peters], N.W.
Diporophora bilineata [Gray], N. and N. W.
Diporophora australis [Steind], N.
Diporophora bennettii [Gray], N.W.
Physignathus gilberti [Gray], S.W., N.W., and N.
Physignathus longirostris [Blgr.], S.W. and N.W.
Physignathus temporalis [Gthr].
Physignathus lesueurii [Gray].
Chlamydosaurus kingii [Gray], The "Frilled Lizard," N.W.
Moloch horridus [Gray], the "York" or "Mountain Devil," S.W. and C.

Family XII.—Varanidæ, "the Water Lizards."

Varanus varius [Shaw], the "Lace Lizard" or "Long-tailed Iguana."
Varanus belli [Dum and Bibr]
Varanus giganteus [Gray], N.
Varanus gouldi [Gray].
Varanus punctatus [Gray].
Varanus acanthurus [Blgr.], N. and N.W.
Varanus caudolineatus [Blgr.], N.W.

Family XVIII.—Scincidæ. "Skinks."

Egernia luctuosa [Ptrs.]
Egernia whitii [Lacép.]
Egernia kingii [Gray] S.W.
Egernia cunninghami [Gray.]
Egernia stokesii [Gray] S.W. and N.W.
Egernia depressa [Gthr.] S.W.
Trachysaurus rugosus [Gray] "Stump-tailed Lizard."
Tiliqua scincoides [White] "The Blue-tongued Lizard."
Tiliqua occipitalis [Peters] S.W. and C.
Lygosoma lesueurii [D. and B.]
Lygosoma lesueurii var. inornata [Gray].
Lygosoma fischeri [Blgr.] N.W.
Lygosoma labillardierii [Gray].
Lygosoma quoyi [D. & B.]
Lygosoma pallidum [Gthr.] N.W.
Lygosoma isolepis [Blgr.], S.W.
Lygosoma richardsonii [Gray].
Lygosoma monotropis [Blgr.].
Lygosoma mustelinum [O'Shaugh.].
Lygosoma infrapunctatum [Blgr.].

Digitized by Google

Lygosoma trilineatum [Gray].
Lygosoma guichenoti [D. and B.].
Lygosoma branchiale [Gthr.]
Lygosoma australe [Gray], S.W.
Lygosoma peronii [Fisch.], S.W.
Lygosoma decresiense [Fisch.], S.W.
Lygosoma quadrilineatum [D. and B.].
Lygosoma microtis [Gray], S.W.
Lygosoma gerrardii [Gray], S.W. and N.W.
Lygosoma lineopunctulatum [D. and B.].
Lygosoma miopus [Gthr.], N.W.
Lygosoma bipes [Fisch.], N.W.
Lygosoma præpeditum [Blgr.].
Ablepharus boutonii [Desj.].
Ablepharus boutonii var. peroni, S.W.
Ablepharus lineo-ocellatus [D. and B.].
Ablepharus greyi [Gray], S.W. and N.W.
Ablepharus elegans [Gray].
Ablepharus muelleri [Fisch.].
Ablepharus lineatus [Gray], S W.

Family XX.—Dibamidæ.

Ophiopsiseps nasutus [Boc.].

CLASS IV.—BATRACHIA.

(Gr. *Batrachos*, a frog).

This class includes the Frogs, Toads, Newts, etc., cold-blooded animals, commonly regarded as Reptiles, but distinguished from these by having gills in the early stages of existence, which some of them retain during their whole life. They have many points in common with fish.

The majority have, when first hatched, a totally different appearance from that of the fully grown animals, the gill-bearing fish-like tadpoles gradually developing limbs and lungs, absorbing their gills, and maturing as frogs, toads, or newts. Hence the class is often termed Amphibia (*amphi*, both; *bios*, life) from its passing one stage in the water and the other on land. They are divided into three orders:—

I.—ECAUDATA (*e*, without; *cauda*, a tail), Frogs, Toads, etc.
II.—CAUDATA (*cauda*, a tail), Newts and Salamanders.
III.—APODA (*a*, without; *podes*, feet), Limbless worm-like Batrachians. Not found in Australia.

ORDER I.—ECAUDATA.

SUB-ORDER I.—BATRACHIA SALIENTIA.

Second Series.—Aglossa diplosiphona.

Family—Myobatrachidæ.

Myobatrachus paradoxus [Schleg.], Swan River.

Family—Engystomatidæ.

Chelydobatrachus gouldi [Gray], Abrolhos.

Digitized by Google

OPISTHOGLOSSA.

First Series.—Opisthoglossa oxydactyla.

Family II.—Cystignathidæ.

Limnodynastes dorsalis [Gray], S.W. and Abrolhos.

Second Series.—Opisthoglossa platydactyla.

Family III.—Hylidæ.

Hyla aurea [Less].
Hyla rubella [Gray], Abrolhos.

CLASS V.—PISCES.

FISH.

Fish are the lowest of Vertebrates. The limbs, when present, are modified into fins; they are either naked or covered with scales; they are cold-blooded, having a heart with two chambers only; breathe by means of gills; pass all their lives in the water, and although a few can exist for some time away from it, yet the majority perish very quickly when removed from their native element. About 13,000 species have been described. Their fossil remains are found as early as the lower Silurian. Fish are arranged in four Sub-classes and nine Orders.

SUB-CLASS I.—TELEOSTEI.

(*Teleios*, perfect; *osteon*, a bone).

The "Bony Fish" includes the majority of living fish. This Sub-class is divided into six Orders.

SUB-CLASS II.—PALÆICHTHYES.

(*Palaios*, ancient; *ichthus*, a fish).

This Sub-class contains two Orders: 1, the Ganoidei (*ganos*, splendour, brightness), the enamelled-scaled fishes, to which the majority of the fossil fish of the Palæozoic and Mesozoic periods belong, while only about 30 species now exist. The skeleton is either cartilaginous or bony. The Barramunda (*Ceratodus*), of Queensland, has both lungs and gills, and consequently can live long out of the water. During the dry season it buries itself in the mud, and remains in a torpid condition until the next rains. This and the Sturgeons are the best known examples. 2, Chondropterygii (*chondros* a grain), contains the sharks and rays, which have a cartilaginous skeleton and a *grained* skin. This, when prepared for commerce, is known as shagreen.

SUB-CLASS III.—CYCLOSTOMATA.

The Lampreys and Hag-fishes.

SUB-CLASS IV.—LEPTOCARDII.

The Lancelet.

Digitized by Google

Sub-class I.—Teleostei (the Bony Fishes).

ORDER I.—ACANTHOPTERYGII.

(*Akantha*, a spine; *pteruz*, a wing.) Spiny-rayed Fishes.

Lates calcarifer (Giant Perch), N.W.
Psammoperca macroptera, N.W.
Psammoperca vaigiensis, N.
Breviperca lineata, Swan River.
Enoplosus armatus [White], Fremantle.
Serranus stigmopomus, N.W.
Serranus corallicola, N.W.
Hypoplectrodes armatus [Castl.], Swan River.
Plectropoma nigrorubrum.
Plectropoma semicinctum, Swan River.
Plectropoma dentex, K.G. Sound.
Plectrodoma serratum, K.G. Sound.
Plectrodoma richardsonii "Rock Cod," Fremantle.
Grammistes sexlineatus.
Mesoprion carponotatus, N.W.
Glaucosoma hebraicum "Jew-fish."
Bostockia porosa
Edelia vittata.
Edelia viridis, Rivers of K.G. Sound.
Therapon caudovittatus [Rich.] "Yellow-tail," W. Coast.
Therapon fasciatus, Swan River.
Therapon ellipticus [Richd.], Broome.
Therapon truttaceus [Macleay], Leonard River.
Helotes octolineatus, K.G. Sound.
Helotes sexlineatus [Cuv. and Val.], Mandurah and Fremantle.
Diagramma affine, N.W.
Gerres australis.
Pentapus vitta, W. Coast.
Erythrichthys nitidus, W.
Oligorus mitchelli [Castel], all West Australian rivers.
Arripis georgianus [Cuv. and Val.] "Sea or Fremantle Herring."
Apogon ruppelli [Gthr.] "Coral-fish."
Pomatomus saltatrix, Fremantle.
Chœtodon sexfasciatus, K.G. Sound.
Chœtodon ocellipennis, K.G. Sound.
Chœtodon strigatus [Cuv. and Val.], Pinjarra.
Chelmo rostratus, N.W.
Chelmo marginalis, Swan River.
Chelmo truncatus, K.G. Sound.
Holacanthus Duboulayi, N.W.
Drepane punctata, N.W.
Scorpis georgianus, K.G. Sound.
Atypus strigatus, Swan River.
Toxotes (Sp. ?), Mandurah and Abrolhos.
Ruppelia prolongata [Castel].
Upeneichthys porosus [Cuv. and Val] a true "Red Mullet," Mandu:
Tephræops Richardsonii, K.G. Sound.
Neotephræops zebra [Rich.], K.G. Sound.
Lethrinus (Sp. ?)
Pagrus unicolor [Cuv. and Val.] "Schnapper."
Pagrus major.
Chrysophrys datnia [Forsk].
Chrysophrys sarba [Forsk] "Silver Bream," Mandurah
Hoplognathus woodwardi [Waite], Fremantle.
Chironemus georgianus, K.G. Sound.
Chironemus marmoratus [Gthr.].
Chironemus maculosus, K.G. Sound.

Digitized by Google

Chilodactylus nigricans [Rich.] "Butter Fish" of Victoria.
Chilodactylus nigrescens, the "Groper," Fremantle.
Chilodactylus nigripes, the "Groper," Fremantle.
Chilodactylus carponenus, "Leather-mouth," Fremantle.
Chilodactylus gibbosus [Rich.], Fremantle.
Scorpæna panda, K.G. Sound.
Scorpæna sumptuosa.
Glyptauchen panduratus, K.G. Sound.
Agriopus leuco-pœcilus, K.G. Sound.
Aploactis milesii, K.G. Sound.
Teuthis tumifrons, Shark Bay.
Beryx mülleri, "King Schnapper."
Pempheris compressus, Swan River.
Pempheris macrolepis, K.G. Sound.
Polynemus tetradactylus, "Tassel-fish," N.
Polynemus verekeri [Kent]. "Vereker's Tassel-fish," Ord. R.
Sciæna antarctica, "Kingfish" (Jew-fish of Eastern States).
Histiophorus pulchellus, Sword-fish, Indian Ocean.
Acanthuros triostegus.
Caranx georgianus [Cuv. and Val.] all Australia.
Caranx gallus, "Diamond-fish" or "Plumed Trevally."
Caranx radiatus, "Fringed Trevally."
Caranx hippos.
Caranx trachurus [Linn.] Horse-Mackerel ("Yellow-tail" of N.S.W.), Garden Island.
Trachurus declivis [Jeny].
Seriola gigas, "Sea Kingfish," Houtman Abrolhos.
Scorpæna panda, K.G. Sound.
Scorpæna sumptuosa.
Temnodon saltuton, "Tailor-fish."
Zeus faber, the "John Dory."
Nomeus gronovii.
Scomber australasicus [Cuv. and Val.], K.G. Sound.
Scomber colias [Gm.], Fremantle.
Auxis rochei.
Percis nebulosa, Shark Bay.
Sillago bassensis [Cuv. and Val.].
Isosillago maculata, K.G. Sound.
Cichlops lineatus [Castel]. Mandurah.
Stigmatonotus Australis, Dirk Hartogs Island.
Antennarius trisignatus, K.G. Sound.
Antennarius subrotundatus.
Platycephalus inops [Jeny], ("Flat-head"), Garden Island and K.G. Sound.
Platycephalus insidiator.
Platycephalus lævigatus [Cuv. and Val.].
Platycephalus castelnaui. K.G. Sound.
Platycephalus bassensis [Culv. and Val.] ("Flat-head") Swan River.
Trigla lucerna ("Springing Gurnard"), Fremantle.
Trigla polyommata [Rich.].
Trigla amæna.
Gobius ornatus, N.W.
Gobius criniger.
Gobius lateralis, K.G. Sound.
Gobius byncensis.
Periopthalmus koelreuteri [Bl.] "Mud-Skipper.'
Boleopthalmus viridis [Buchanan] Leonard R.
Eleotris Castelnaui, Swan River.
Eleotris fusca.
Callionymus calauropomus, N.W.
Sphyræna obtusata, "Sea Pike," Fremantle.

Digitized by Google

Sphyræna novæ-hollandiæ, "Pike."
Mugil dobula [Gthr.] "Sea Mullet," Swan River.
Agonostoma diemenensis, the river mullet called locally "Pilchard."

ORDER II.—PHARYNGOGNATHI.

(*Pharynx*, gullet; *gnathos*, jaw).

Pseudolabrus ruber [Castel], Abrolhos Island.
Coris auricularis [Cuv. and Val.] Mandurah and Abrolhos.
Odax richardsoni [Gthr.] "Rock Whiting," Garden Island.
Odax radiatus.
Siphonognathus argyrophanes [Rich.].

ORDER III.—ANACANTHINI.

(*A*, without *akantha*, a spine).—"Soft finned fishes." *

Pseudorhombus multimaculatus [Gthr.] "Flounder," Fremantle.
Rhombosolea monopus "Flounder," Swan River.
Plagusia acuminata [Cant] "Sole," Garden Island.

ORDER IV.—PHYSOSTOMI.

(*Phusa*, air bladder.)

Plotosus sp. "Cat-fish," N. Coast.
Cnidoglanis megastoma, "Cobbler."
Arius thalassinus "Sergeant Baker," Wyndham.
Aulopus purpurissatus, N. Coast.
Belone ferox [Gthr.] "Long Tom," Garden Island.
Hemirhamphus intermedius [Cant] "Garfish," Garden Island.
Exocœtus hillianus "Hill's Flying Fish," Shark Bay.
Galaxias truttaceus.
Gonorhynchus greyi [Rich.], "Rat-fish," Garden Island.
Chatoëssus erebi [Gthr.], "Perth Herring," Swan River.
Clupea sagax, "A true herring."
Clupea sprattus (?), "The Sprat."
Megalops cyprinoides, "Ox-eye Herring." *
Chanos salmoneus.
Gymnothorax richardsoni [Bleeker], Fremantle.

ORDER V.—LOPHOBRANCHII.

(*Lophos* a crest; *bragchia*, a gill).

Gastrotokeus biaculeatus, N.W. Coast.
Muræna helena.
Muræna picta.
Solenognathus hardwicki, "Pipe-fish," S.W. Coast.
Hippocampus brevirostris, "Sea-horse," Fremantle.

ORDER VI.—PLECTOGNATHI.

(*Plecto, I bind. Fish in which certain bones of the jaw are immovably connected.*)

Monacanthus peronii [Hall], "Leather Jacket," Fremantle.
Ostracion lenticularis, "Bony Blow Fisha," Fremantle.
Chilomycterus jaculiferus, "Porcupine Fish," Rockingham.
Diodon maculata, "Common Porcupine Fish," N.W.

---

* The flat-fishes, when young, are perfectly symmetrical, and have an eye on each side, and swim like other fish; but when fully grown they are "one-sided," always live on the bottom, and swim on one side, with an undulating motion of the body.

* These gigantic Herrings attain a length of four to five feet. Indian Ocean and Rivers of North and North-West coasts.

Digitized by Google

SUB-CLASS II.—PALÆICHTHYES.

ORDER VII.—CHONDROPTERYGII.

Zygæna malleus [Shaw], "Hammer-headed Shark," Fremantle.
Lamna cornubica.
Crossorhinus barbatus [Linn], "Carpet Shark."
Cestracion phillipi, "Pavement-toothed or Port Jackson Shark," Fremantle.
Raja aquilla, "Eagle Ray," Fremantle.
Raja punctata, "Thornback Ray," Fremantle.

Legislation in connection with Native and Imported Birds and Animals.

(55 Vict., No. 36, and 64 Vict., No. 7.)

CLOSE SEASONS.

Birds.

Black Swan (proclaimed 4th April, 1894), Emu (27th September, 1894), Straw-necked Ibis (4th July, 1893), Bittern, Magpie, Laughing Jackass, Wattlebird, Wagtail, and Robin Redbreast (7th June, 1892), Finches and Doves (16th April, 1902), *are strictly preserved throughout the State*, and their destruction anywhere, at any time, and in any way is wholly forbidden.

Wild ducks of all species are protected throughout the whole State, with the exception of the Kimberley Division, from 1st July to 23rd December, both days inclusive (proclamation 6th November, 1901).

The close season for Wild Geese, Bustard or Wild Turkey, Swamp Hen, Bronze-winged and other Pigeons, Gnow, Quail, Rottnest and other Snipe (proclaimed 7th June, 1892), throughout the South-Western Division of the State, and including a strip of land five miles wide from the mouth of the Fitzgerald River, along the South coast to within 20 miles of Eucla, where there is a special reserve, measuring 20 miles along the coast by 10 in depth, is from 1st July to 30th November, both inclusive.

For Booby, Frigate Bird, Noddy, Pelican, Curlew, Sea Pie, Sea Snipe, Mutton Bird, Red Bill, Cormorant or Shag (7th June, 1892), for all that part of the State North of the Moore River, from 1st June to 30th September, both inclusive.

Animals.

There is no proclaimed close season for any native animals.

GAME RESERVES.

Birds.

(Proclamation 3rd August, 1898.)

Portions of the Swan River, as follows :—

From the Midland Railway Bridge (Upper Swan), over said river, downwards to its mouth and to the extreme Western end of the breakwater at Fremantle; to include Perth and Melville *waters and Freshwater* Bay.

Digitized by Google

Portions of the Helena River, as follows:—

From the Canning Jarrah Timber Company's Railway Bridge, over Helena River, downwards to its junction with the Swan River.

Portions of the Canning River, as follows:—

From the South-Western Railway Bridge, over the Canning River, downwards to its junction with the Swan River.

The Vasse River and Estuary, within the boundaries of the municipality; proclaimed 6th February, 1901.

The Leschenault Estuary, from its head to its entrance into the sea at Bunbury; proclaimed 31st July, 1895.

Monger's Lake and Herdsman's Lake, near Leederville; proclaimed respectively 3rd January, 1901, and 15th February, 1902.

The Abrolhos Islands, proclaimed 26th May, 1898; and Pelican Island, in Shark Bay, proclaimed 15th March, 1900.

Animals.

A reserve for Kangaroos was proclaimed on 8th March, 1901, which includes all that portion of the State "bounded on the South and West by the sea coast; on the North and Eastward by an East line from the sea coast through Mount Lesueur to a point North of Kellerberrin; thence South till it intersects a South-Easterly line extending from Mount Stirling to the mouth of Fitzgerald River, and along said line South-Easterly to the mouth of Fitzgerald River aforesaid, including the islands adjacent to the sea coast aforesaid."

In this reserve Kangaroos are strictly preserved, and may be killed for food only, but not for sale or barter.

The penalty for destroying, disturbing, or attempting to destroy or disturb, any native game during the close season for such game, or at any time during the year, any bird or animal whatever on any proclaimed reserve, or anywhere in the State, at any time, any bird or animal declared to be strictly preserved, is that any person so offending shall, on conviction, pay a sum not exceeding £5, in addition to the sum of 10s. for each bird or animal so destroyed or taken, and any gun or other instrument used may be ordered to be forfeited.

Under 68 Vict., No. 7, no swivel or punt gun is to be used against native birds under penalty not to exceed £5 and forfeiture of gun.

Under 49 Vict., No. 18, no person can use or carry a gun within the boundaries of a municipality or within a distance of five miles beyond such boundaries, except in a dwelling house or the grounds in which it stands, without having obtained a license, on payment of the fee of 5s., and no person under the age of 16 can obtain a license.

Digitized by Google

It should be carefully noted that the term "gun" includes a firearm of any description, and an air-gun or any other kind of gun from which any shot, bullet, or other missile can be discharged.

The penalty for carrying a gun without a license is a fine not to exceed £2.

Eggs of imported and native birds for which a close season has been proclaimed may not either be wilfully destroyed or stolen, under a penalty of the payment of a sum not to exceed 10s. for each egg destroyed or found in any person's house or possession.

The Government has purchased a number of Black Swans in different districts of the State, and they are to be seen on the Swan River, opposite to Perth, between the Causeway and Melville Water, in company with numerous wild ones attracted by them.

For the better protection of fish a reward of 6d. (sixpence) per head is offered for the destruction of Cormorants or Shags in any portion of the State South of the Moore River except in the Leschenault Estuary, and, unless by license, in that portion of the Swan River which lies between its entrance into the sea at Fremantle and the Perth-Bunbury Railway and Lower Canning Bridges.

Destructive Birds.

Under the 57th Victoriæ, No. 22, the importation of Sparrows into the State is forbidden, and by proclamation of 22nd January, 1896, the introduction of Starlings, Blackbirds, and Thrushes is absolutely prohibited.

Destructive Animals.

The importation or keeping of Rabbits is unlawful under the "Destruction of Rabbits Act, 1883" (47 Vict., 16).

By proclamation, 26th November, 1895, the introduction of Flying Squirrels, otherwise known as Flying Foxes, into the State is prohibited.

By an Order in Council, dated 17th July, 1901, framed under the provisions of "The Stock Diseases Act, 1895" (59 Vict., 34), the introduction of Foxes and Hares is forbidden.

A reward of 10s. or 5s., according to the district, is offered by the Government for the destruction of the Dingo or Native Dog, the proof of which consists in the production of the tail before a Justice of the Peace.

Fish and Fisheries of Western Australia.

Western Australia, with its extensive sea coast, produces, as might be anticipated, a most abundant and varied fish fauna. Extending from the parallel of latitude 14° in its Northern, to latitude 35° in its Southern boundary, this coast-line is associated with the essentially distinct fishing products and industries peculiar to both tropical and temperate regions. The Southern limits yield the same oyster, *Ostrea Edulis*, that is common

Digitized by Google

to the States of Victoria, Tasmania, and South Australia; crayfish most nearly resembling the New South Wales variety, and edible fishes which, while corresponding generally with those of the four above-named States, include others that are essentially West Australian. Briefly reviewing the varied commercial fish fauna, we find that the several species of schnapper, whiting, flathead, bream, garfish, taylor, trevally (locally known as skipjack), flounders, so-called Colonial salmon (*Arripis*), and many others are identical with the similarly named species of the Melbourne, Sydney, and Adelaide markets. Added to these occur, most notably, the jew-fish, *Glaucosoma Hebraicus*, peculiar to Western Australia, esteemed for the table, and somewhat the aspect of a schnapper; the river or estuarine kingfish, *Sciæna Antarctica*, identical with the mulloway of Adelaide, and the jewfish of Sydney and Brisbane; the sea kingfish, *Seriola Gigas*, not unfrequently weighing over one hundredweight, also peculiar to the State, but allied to the Samson fish and yellow-tail of the respective Sydney and Melbourne markets, and the so-called king schnapper, *Beryx Mulleri*, allied to the fish bearing the same name in Adelaide, and known in Sydney as the Nannegai.

The waters in the neighbourhood of Albany and Fremantle produce also several large and valuable market species of the genus *Chilodactylus*, pertaining to the *Cirrhitidæ* or trumpeter family, for which Tasmania is so justly famous, one representative of the genus *Chilodactylus Nigricans*, known at Fremantle as the groper, being identical with the Victorian butter fish. Among the smaller species of fish that demand notice in consequence of their occurrence in practically inexhaustible shoals, to which are added excellent edible qualities, reference may be made to the so-called sea or Fremantle herring, *Arripis Georgianus*. This fish is in no way related to the true herring, *Clupeidæ*, and is identical with the "Ruffy" or "Tommy Rough" of the Melbourne market. It occurs in such profusion throughout the year in the neighbourhood of Fremantle as to constitute a staple fishing and source of sport to all classes of the community, and in both its fresh and smoked conditions is placed extensively upon the market. Under the last-named auspices its resemblance in both flavour and aspect to the familiar kippered herring of the old country is by no means remote and it constitutes in like manner, in the opinion of many connoisseurs, an equally excellent adjunct to the breakfast table. A true herring, *Chatœssus Erebi*, locally known as the Perth herring, abounds in the Swan, Murray, and other Southern river estuaries, and, similarly cured, commands an extensive sale. In consequence, however, of the abnormal development of fine bones in proportion to its size, it is not as highly esteemed as the species previously referred to. Another herring, *Clupea Sagax*, closely resembling the English pilchard, and identical with the Sydney "maray," is not unfrequently taken in shoals off Fremantle, and is excellent eating. The grey mullet tribe, *Mugilidæ*, represents, as in the adjacent States, a substantial and permanent source of food supply in the Perth and Fremantle markets. The large sea-mullet, *Mugil dobula*, is the most important and highly esteemed member

Digitized by Google

of this family, the next in importance being the so-called pilchard, *Agonostoma diemensis*, elsewhere known as the river mullet. Both of these species are extensively placed upon the market in both the fresh and cured conditions, while the sea-mullet is more especially made the object of attention at the fish canning establishments at Mandurah, on the Murray River estuary. A true red mullet, *Upenæus porosus*, is not unfrequently taken in the neighbourhood of Fremantle.

Farther North, in the Geraldton and Shark Bay districts, the schnapper, mullet, whiting, and a few others are still identical with the Southern types. There commences here, however, an intermingling of the more essentially tropical sea-breams of the genus *Lethrinus;* so-called rock-cods, of the genus *Serranus;* and brilliantly coloured species belonging to or allied to the genus *Genyoroge*. Arriving fairly within the tropics, the Southern cool-water species entirely disappear, and are replaced by a fish fauna that corresponds very closely with that of the North Queensland coast, and including the majority of the species enumerated and figured by Kent in his volume on the fishery products and potentialities of the Australian Great Barrier Reef. In addition to the several tropical types previously referred to, there occur several species of tassel fish, genus *Polynemus*, distinguished by the free filamentous rays of their pectoral fins. Some of these attain to the calibre of over one hundredweight, are in all cases excellent eating, and are additionally valued in India on account of the superior quality of isinglass that can be manufactured from their sounds or swimming bladders. Giant mackerel of the genus *Cybium*, allied species of the genus *Chorinemus;* so-called John Dorys, of the genera *Drepane* and *Stromatius;* huge gropers, *Oligorus;* giant herrings, three or four feet long, referrable to the genera *Chanos* and *Megalops;* the giant perch, *Lates calcarifer*, identical with a highly esteemed Indian type; numerous species of trevally, distinct from the Southern varieties; and a host of others possessing excellent gastronomic qualities abound throughout that restricted area of the tropical Nor'-West coast line which has, so far, been systematically investigated. Excepting for the levying of a very limited local supply, this abundant fish harvest of the Northern districts is practically ungarnered, and presents an inexhaustible field for future enterprise.

Sharks, principally the Ground Shark, Hammer Head, Blue Nose, and the Tiger Shark, are common along all the coast.

Dugong, Whales, and Seals are still found, but are not nearly as numerous as formerly.

Of crustaceans, there are the Cray-fish, *Palinurus Vulgaris* and *Themis Orientalis;* Crab, *Neptunus Pelagicus* and *Cenobita sp.;* Shrimp, and Prawn, all of which are to be obtained in very large quantities. The Cray-fish abound near the reefs which fringe the islands along the coast; Crabs and Prawns are principally found in the rivers and estuaries. An effort is being made to introduce

Digitized by Google

Cray-fish along the Bunbury Breakwater which has been lately completed. The Cray-fish being far superior in flavour to the imported lobster, its abundance suggests the establishment of canneries as a profitable investment.

The taking of Prawns by means of a net other than a hand scoop net is prohibited by Proclamation dated 6th November, 1901, in that portion of the Swan River extending downwards from a line drawn from Point Walter to Point Resolution, and from the Narrows extending upwards. Also in that portion of the Canning River extending upward from a line drawn due South from Salter's Point. The length of nets used for the capture of Prawns within other portions of the Swan and Canning Rivers open for Prawn fishing must also not exceed fifteen fathoms, the mesh of which shall not be less than one half-inch.

The only factories now engaged in fish preserving are those situated on the Murray Estuary, about 40 miles South of Fremantle. This river abounds in fish of various descriptions, but the kind principally preserved is the Sea Mullet, which is excellent in flavour, and has already gained considerable repute both in and outside the State.

Fishing by means of a net or fixed engine is prohibited within the following waters:—

In and about the Swan River.—From the Narrows, at Mill Point, in Perth Water, to the Upper Swan Bridge (by Regulation of 7th June, 1892). That portion of the Swan River and its tributaries from the Perth Causeway Bridge upwards (6th February, 1901). Also below Point Walter and Point Resolution, and in that portion of the sea within a radius of a quarter of a mile from the Western extremity of the North Mole, Fremantle.

In the Canning River.—From the Lower Canning Bridge to the Upper Canning Bridge (by Regulation of 7th June, 1892).

Fishing is allowed in the remaining portions of the Swan and Canning Rivers, but the size of the mesh is regulated to be not less than 2¾ inches, under Regulation made 14th September, 1898.

Net-fishing is further prohibited:—

In the Denmark and Hay Rivers.—Denmark River, and that portion of Wilson's Inlet within a radius of half a mile from the mouth of said Denmark River; Hay River, and that portion of Wilson's Inlet within a radius of half a mile from the mouth of said Hay River. (Regulation, 13th December, 1899.)

In any part of Taylor (Nannarup) Inlet. (Regulation, 13th December, 1899.)

In the Kalgan and King Rivers. (Regulation, 4th December, 1899.)

Digitized by Google

In that portion of Oyster Harbour bounded by lines starting from Point Henty, and extending Southward along the Western shore of Oyster Harbour about 20 chains; thence South-Easterly to a point on the Eastern Shore of Oyster Harbour aforesaid, situate 15 chains Southward from Swan Point; thence Northward and Westward along part of the Eastern and Northern shores of said Oyster Harbour to a point due North from Point Henty; thence South to the starting point. (Regulation, 4th December, 1899.)

In the Entrance to Oyster Harbour.—The North and South boundaries being East and West lines passing through points situate 10 chains North and 10 chains South, respectively, from Emu Point; the East and West boundaries being the East and West shores of said entrance. (Regulation, 4th December, 1899.)

In the Murray and Serpentine Rivers, with their Estuaries, the entrance to Peel's Inlet, and portion of the sea, more particularly described hereunder:—*No. 1 Bank*—Bounded by lines starting from a point on the sea-shore situate due West from the North-West corner of Murray Location 2, and extending North one mile; thence East to the sea-shore, and along it and the entrance to Peel's Inlet Southward and Eastward to a point East of the East end of Creery Island; thence West to said end and Westward along the South shore of said Creery Island to its Southernmost point; thence Westerly to the South-East corner of Murray Location 5; thence by the Western shore of the entrance to Peel's Inlet and the sea-shore Eastward, Northward, Westward, and Southward to the starting point. *No. 2 Bank*—Bounded by lines starting from a point on the Eastern shore of Peel's Inlet, situate East of the Southernmost point of Goongoolup Island, and extending West through said point for half-a-mile; thence North to the said shore of Peel's Inlet, and along it Southerly to the starting point. To include also the Murray and Serpentine Rivers and their Estuaries. (Proclamations, 12th September, 1900.)

Herring and Salmon fishing is allowed in all that portion of No. 1 Bank (entrance to Peel's Inlet) situate outside (seaward) the Bar, from the 1st April to the 31st December in each and every year. (Proclamations, 9th June, 1899, and 12th September, 1900.)

Net-fishing is further prohibited:—

In that portion of Koombana Bay situate Southward of a line extending about 64° from the junction of the Stone Causeway with the Bunbury Jetty to a white post on the shore of North Bunbury. (Proclamation 7th March, 1900.)

Digitized by Google

In (*a.*) *the Vasse and Wonnerup Estuaries;*

(*b.*) *Their entrances into the sea;*

(*c.*) *That portion of the sea* within a radius of $1\frac{3}{4}$ miles from the mouth of the Wonnerup Estuary;

(*d.*) *That portion of the Deadwater* within a distance of 10 chains North-East from its entrance into the Wonnerup Estuary. (Proclamation, 7th November, 1900.)

Fishing is allowed within that portion of the Deadwater situate North-Eastward of a point 10 chains North-East from its entrance into Wonnerup Estuary, but the size of the mesh is regulated to be not less than 3 inches. (Proclamation, 15th March, 1900.)

Fishing for Schnapper is prohibited—

In any part of Warnbro' Sound (Safety Bay) from 1st October to 31st December (both days inclusive), in each and every year. (Regulation, 6th August, 1899.)

Fishing for Crayfish is prohibited—

In the Swan River and that portion of the sea within a radius of half-a-mile from the Western extremity of the North Mole, Fremantle. (Proclamation, 16th January, 1901.)

Within the sea limit of half-a-mile from high-water mark on Rottnest Island. And also during the months of November, December, and January in each and every year no female Crayfish carrying Ova on the underside of the tail or abdomen may be taken in any portion of the sea; and during said months it is unlawful to offer for sale or have in possession any such female Crayfish. (Proclamation, 27th June, 1900.)

Fishing is also prohibited—

In the Preston, Collie, and Brunswick Rivers, and that portion of the Leschenault Estuary lying South of a straight line drawn from the Northern mouth of the Collie River, starting from the South-West corner of Wellington Location 31 to the South-East corner of Wellington Location 24 on the opposite or Western bank of the said Estuary; and to use any net of less than $1\frac{1}{2}$-inch mesh or gauge in the waters of Bunbury Harbour. (Proclamation, 27th March, 1902.)

Seals are protected throughout the State by a close season extending from 1st November to 31st March. (Proclamation, 7th June, 1892.)

Any person using dynamite or any other explosive substance for catching or destroying fish within the territorial dominion of the State, is liable to fine and imprisonment.

Digitized by Google

The public Oyster Fisheries are protected by statute, under which also licenses for the formation, planting, and protection of private oyster beds can be granted.

Under "The Fisheries Act, 1889," fish of the following species of a less weight than that set against their name cannot be sold or offered for sale under a penalty of a fine varying between £5 and £20, and the forfeiture of the fish, etc.

Schedule.

	Ounces		Ounces.		Ounces.
Bream	4	Perch or Yellow Tail	4	Sand Mullet or Pilchard	4
Bream (silver) ...	4	Perth Herring ...	3	Skipjack	4
Butter Fish	4	Pike	8	Sole	4
Flathead	4	Rock Cod	4	Taylor	6
Flounder	6	Salmon Trout ...	2	Whiting	3
Garfish	2	Schnapper	8	Crayfish	12
Gurnet or Gurnard	4	Herring (sea) ...	2		
Mullet	6				

The species of fish can, however, at any time be added to, or omitted, and the weight altered.

All nets also must be emptied in the water, and not dragged up on land, under a penalty of between £2 and £20.

Fish can also on no account be used for manure, under penalty not exceeding £20.

Pearl and Pearl-shell Fisheries.

While the ordinary food-fishes of the tropical coast-line of Western Australia represent an as yet undeveloped potentiality, the pearl and mother-of-pearl shell fisheries of the Nor'-West have constituted for the last quarter of a century one of the leading assets in the State's wealth, their average annual value within the past ten years being represented by no less a sum than from £50,000 to upwards of £100,000.

Two distinct species of mother-of-pearl shell contribute towards the export trade of this article from Western Australia. The main and more valuable moiety is represented by the large mother-of-pearl shell, *Meleagrina margaritifera*, that is limited in its distribution to tropical waters, and is obtained more or less abundantly from Exmouth Gulf Northwards. This is the species from which massive mother-of-pearl shell articles, such as dessert and fish knife and fork handles, buttons of the largest size, and inlaid work are manufactured. It also represents the species from which the largest and finest pearls are obtained. The wholesale value of mother-of-pearl shell in the London market is subject to considerable fluctuation, the sale price of the larger Nor'-West species having ranged within the past few years from £80 or £90 to as much as £200 per ton, and in earlier years having been considerably higher. The fishing for the Nor'-West shell is now conducted almost exclusively with the aid of diving apparatus, in water varying in depth from four or five to as much as eighteen or twenty fathoms. At these last-named depths the pressure of the superincumbent water is exceedingly trying to the divers, involving, under prolonged

Digitized by Google

exposure to it, paralysis of the limbs, or, it may be, loss of life. The invention of apparatus that will enable the divers to work with immunity from danger at a depth only slightly in excess of that from which shell is now collected would throw open vast fields of virgin shell, and be a priceless boon to the prosecutors of this important industry. In the early days of the Nor'-West mother-of-pearl shell fishery, the shell was obtained with the assistance of natives, who gathered it from the reefs when laid bare by the low spring tides, or collected it by diving, without the aid of apparatus, in shallow water. These shallower inshore banks having for the most part been worked out, led to the discovery of the practically inexhaustible supply that obtains in the deeper waters, ranging from three or four to over twenty miles off the coast.

The second species of mother-of-pearl and pearl-producing shell indigenous to Western Australian waters is that known commercially as the Shark Bay variety, *Meleagrina imbricata*. This species is of comparatively small size, rarely exceeding four or five inches in diameter, and so thin in texture that it is almost exclusively used for the manufacture of buttons of small and inferior descriptions. Shark Bay shell was formerly fished for on account only of the number and value of the pearls that it produced, the shell being regarded as waste material. A range of from £15 to £25 (last quotations £18) per ton represents the somewhat fluctuating prices that this shell has, within recent years, commanded in the London market. While a substantial portion of the pearls produced by the Shark Bay shell are of excellent shape and lustre, bright golden yellow or straw coloured ones are the more abundant, and are peculiar to the district. While not so much in favour in Europe, these coloured pearls find a readier sale in India and China. The fishery for Shark Bay pearl-shell is conducted on a distinct principle from that of the large Nor'-West species, being collected by dredging after the manner of oysters from the deeper water, and gathered by hand during favourable tides from off the shallow banks. Through persistent and reckless overfishing the formerly prolific shell-producing banks of Shark Bay have, within recent years, been so greatly exhausted that a somewhat prolonged period of repose, combined with substantial efforts in the direction of systematic cultivation, are requisite in order to restore this fishery to its former prosperity. A small quantity of Nor'-West shell that was transported to Shark Bay in the year 1893, successfully survived the relatively low temperature of the water during the winter in this more Southern latitude. The capacity of the larger Nor'-West shell to live and propagate in Shark Bay being thus assured, it only remains to repeat these transportation experiments on a substantial scale to inaugurate a new and valuable fishery. As the result of a recent investigation, it is anticipated that the vicinity of the Abrolhos Islands, thirty miles West of Geraldton, will prove equally eligible for the artificial culture of the large Nor'-West pearl shell. The waters surrounding these islands are warmer than those of Shark Bay, and abound with corals, fish, and other marine organisms of an essentially tropical description.

Digitized by Google

The Nor'-West fishery includes the coastal waters and outlying islands from Exmouth Gulf, in latitude 22° South, to Cambridge Gulf in latitude 15° South.

The Shark Bay fishery embraces all the waters of Shark Bay, "bounded by a South-West line from Charles Point, on the mainland, to Cape Ronsard, at the North end of Bernier Island; then by the Western shores of Bernier and Dorre Islands to Cape St. Cricq; then by a straight line to Cape Inscription, at the North end of Dirk Hartogs Island, and by its Western shore to Surf Point, and thence by a straight line to Steep Point on the mainland." (*Vide* 55 Vict. IX, section 13.)

No ship can be used or employed on any Pearl Shell fishery of the State, other than that at Shark Bay, without first obtaining a Pearling License, the cost of which is £1.

Turtle and Beche-de-mer.

Neither the fishing for turtle nor for bêche-de-mer has yet assumed those proportions upon the West Australian coast which it may be reasonably expected to reach in future years. For centuries prior to British colonisation it would appear that the Malays were in the habit of repairing in their proas to the reefs and outlying shoals of the far Nor'-West with the object of collecting and curing the trepang or bêche-de-mer which this region produces in considerable abundance. At the present time the fishery for bêche-de-mer is chiefly limited to desultory operations on the reefs in the neighbourhoods of Cossack and King Sound, leaving a vast area of productive ground North and East practically untouched. The species of bêche-de-mer that is most extensively collected from the grounds at present fished is closely allied to, though not precisely identical with, the so-called surf red-fish of the Queensland coast. The superior and most valuable species, including teat-fish, black-fish, and the ordinary red-fish, for which the Torres Straits and the Queensland Great Barrier Reef are pre-eminently famous, have not so far been met with on the Nor'-West reefs, but, it is somewhat remarkable to observe, have been recently discovered, though in relatively small quantities, on the extra-tropical Abrolhos Islands. While insufficient in number in this limited area to constitute an independent trade, the Abrolhos bêche-de-mer should be capable of profitable utilisation in conjunction with other local fishery industries.

Turtle of the most valuable qualities, including the aldermanic green turtle, *Chelone Mydas*, and the tortoiseshell producing hawksbill, *Chelone Imbricata*, abound on the Western Australian coastline on Houtman Abrolhos, and from Shark Bay Northwards. Excepting for local consumption no attempts have hitherto been made to turn these abundant natural supplies to practical account. There can be no doubt that there are numbers of locations on the Nor'-West coast, such as the Lacepede Islands, whereat extensive and profitable stations might be established for the wholesale

Digitized by Google

export of the living animals, and for the curing or preparation of those commercial products of the turtle which have hitherto been mainly obtained for the European market from the West Indies and the Island of Ascension.

Oyster Fisheries.

Oysters do not at the present time constitute a leading item in the indigenous fishing industries of Western Australia. Thick-shelled rock oysters, *Ostrea Mordax* and *Ostrea Glomerata*, abound at various places along the coast from Geraldton Northwards, and a considerable number are sent down to the Perth and Fremantle markets from the neighbourhoods of Shark Bay and Carnarvon. There is at the same time, however, an extensive supplementary importation from Queensland and New South Wales. In former years the large so-called mud oyster (*Ostrea Angasi, var.*) identical with the British "Native," was abundant in the vicinity of Albany, but was so exhaustively fished as to have been almost exterminated. In a semi-fossilised state this species also occurs in beds of vast extent in the Swan River basin, its extinction having been apparently brought about by changes in the form of the river estuary, through which means the areas formerly favourable to the growth of oysters are now submerged by fresh water for too long an interval during the winter floods to permit of their survival. Oyster beds that apparently owe their extinction to analogous conditions are likewise traceable in several other estuarine areas of the Northern portion of the State. Steps are taken by the Government to re-establish the oyster beds of Oyster Harbour, near Albany, and to inaugurate the profitable cultivation of the bivalve in the neighbourhood of Fremantle and other suitable localities. Should these operations be associated with the success that may be reasonably anticipated, many years will not elapse before Western Australia should be in a position at all events to produce all the oysters the State requires for home consumption.

Acclimatisation of Fresh Water Fish.

(*Particulars supplied by the Secretary of the Acclimatisation Committee.*)

The fresh water rivers of the more thickly populated Southern Districts of Western Australia being very deficient in indigenous fish of economic value, active measures are now in course of operation with the object of stocking these rivers with English trout, salmon trout, and other suitable species. The following extract from the last Annual Report of the committee appointed to carry out acclimatisation work, shows what has been done towards the acclimatisation of trout and other fish:—

Trout.—Between 3,000 and 4,000 salmon trout fry were again set free in the Upper Canning, and these, together with those liberated in previous years, should be sufficient to stock the stream if its waters should be proved suitable. In addition, 250 fry were liberated in the Blackwood River, and 50 strong fish in the Collie. Reports of fair-sized trout having been seen reach the Committee from time to time, but it is difficult to obtain exact information on the subject, and it is still harder to get verification of reports of fish being occasionally caught. A supply of rainbow trout has been

Digitized by Google

ordered this season from New Zealand, and is expected to arrive shortly. This species of trout is thought to be most suitable for the conditions prevailing in Western Australia, where the water is generally of a high temperature in summer, and where the rivers and streams cease to run early in hot seasons.

Other Fish.—During the year a present of Murray perch was made to the Committee by the Geelong Fish Acclimatisation Society. Unfortunately, owing to very rough weather experienced on the passage over, the shipment did not prove a success, as the needful attention in aerating the cans could not be given to them. The few fish that survived the voyage were placed in the Collie by Mr. Gee (the Mining Registrar), and they should prove enough to stock that stream. A second consignment of perch also proved a failure for the same reason, viz., bad weather on the voyage, which rendered proper attention to them impossible. Another shipment of perch was sent by the mail steamer *Omrah*, it being hoped that the superior facilities afforded by a steamer of this size would enable the fish cans to be properly aerated in all weathers, as moving fish in cans is a very delicate business, and the slightest inattention to detail is fatal even under favourable circumstances. The percentage of deaths is great owing to the shock sustained in the capture of the fish and their necessary confinement in limited spaces. During the year gratifying evidence of the success of the former acclimatisation efforts has been reported, notably of the Murray perch and cod, one of the latter, it is said, having been taken near Beverley weighing upwards of 20lbs.

Several shipments of fish have been received and liberated since the above report was written, and it is confidently expected that satisfactory results will eventually be obtained, when the nature of the water supply in the local rivers and the influence of the climatic conditions come to be better understood.

8.—A GLIMPSE OF WEST AUSTRALIAN ENTOMOLOGY.

(By H. M. Giles, Esq.)

The entomological fauna of this vast State is unfortunately almost unknown to science, even within our own immediate boundaries, for if we except the notes made by a few naturalists who have visited the State, at long intervals, and have collected, over very limited areas of the coastal districts in the vicinity of Albany, Swan River, and Geraldton, we are practically in the dark as to the extent of insect life as distributed throughout the State. Mr. A. M. Lea, late Government Entomologist, in a former article dealing with this subject, estimated that probably 30,000 species of insects will be found indigenous to this State. This is in all likelihood a safe estimate, and it seems also likely that as these species get to be known and described, the greater part of them will be found *to be new to science. The study* of its insect fauna has

Digitized by Google

probably been more neglected in Western Australia than in any of the other States, but it is to be hoped that this reproach will not be applicable much longer. Workers in this branch of science will find here amongst the different orders many peculiar and highly interesting forms, which will amply repay them for the time and labour spent in their observation. Although collectors will no doubt do their share of the work, that share will be infinitesimal compared with the labour involved in the unravelling of the "life histories," and it is to be feared that this more intimate acquaintance will not, or rather perhaps cannot, be properly acquired for many long years. In this connection it has to be borne in mind that many specimens take years to arrive at perfect maturity, some of the timber-feeding beetles, for instance, having been found to spend about five years in the larval state. In addition to the insects indigenous to Western Australia, there are in the State many foreign ones, which will be subsequently briefly alluded to in their proper places.

The limited space available for this article renders it difficult to deal satisfactorily and explicitly with a subject of so comprehensive a nature. Such being the case, scientists will pardon the use of homely terms, in referring to specimens of the different orders.

As it is concerning the great order of *Coleoptera*, or *Beetles*, that the most information has up to the present been gained, it will perhaps be best to take them first, seeing also that from this order forms peculiar to Western Australia can most readily be selected. Commencing with the large group of *Carabidæ* or *carnivorous beetles*, it must be pointed out that these, instead of being destroyed by the horticulturist, as is so often the case, should be protected by him as being amongst his best friends. Mistakes of this kind arise, of course, from inability to distinguish between friend and foe, and it is greatly to be hoped that the day is not far distant when a few—even if only very elementary—lessons in entomology may be included in the course of the State schools; there is no possible doubt as to the advantage such a knowledge would prove to the State before many years, in view of the large areas which are being planted in fruit trees alone. Two of the largest of the group met with here are *Hyperion Schrutteri*, which measures nearly three inches in length, and is of a deep shining black colour, and *Megacephalus Waterhouseri*, which is about two inches long and nearly an inch in width. This group contains a number of fair-sized specimens, but is numerically far stronger in the various smaller specimens. Mention may next be made of the interesting *Australian Bombardier* beetle, which can be obtained in large numbers along the Swan River. It is about an inch in length, and has jet black elytra (wing cases), with a large yellow blotch on each, and yellow legs. As soon as it is disturbed or touched it discharges, with a loud report, a quantity of fluid, which, if it comes in contact with the skin, produces a burning sensation, and a stain very similar to that caused by nitric acid. Chemical

Digitized by Google

tests prove it to be an acid. It is among the *Scarabæidæ* that many of the most formidable looking beetles are to be found. Some of these have as many as five long sharp spines on the thorax, with another on the head working in opposition, the legs being also very spiny, or flattened out into knives or spades. This formation is of the greatest assistance to them in burrowing into the soil and carrying down manure, which they do with surprising agility. Other specimens again cut and devour vast quantities of decaying wood.

One of the most conspicuous beetles is *Eupœcila inscripta*, which, in colour, is a lovely pale, bronzy green, with a distinct M on its back. It is found in the Roebourne district. Another remarkable insect found in that part of the State is a highly-burnished emerald green species of *Lomaptera*, and it seems certain from what can be learned from prospectors, who, unfortunately, will not as a rule take the trouble to collect such things, that there are many more gems in this sub-family waiting to be discovered, and at present "wasting their sweetness on the desert air." There are in this State some very fine specimens to be obtained among the *Cockchafers*, as the boys invariably call the *Rutilidæ* and *Melolonthidæ*, comparatively few of which are as yet scientifically known. The *Lucanidæ* or *Stag Beetles*, which are so much sought after by collectors, appear from the present very limited experience of the writer to be only very moderately represented. A genus typical of Australia is *Lamprima*, represented here by two fine species, *Micardi* and *Varians*, out of twelve recorded for the continent. So far, the writer has only met with three other genera—one a very small specimen of *Syndesus cornutus*, which is the only species at present recorded for Australia, although the genus is, curiously, represented in New Caledonia and South America; two specimens of *Figulus lilliputanus*, which is widely distributed; and a small species of *Ceratognathus*, which may possibly be new, but more specimens must be obtained before this can be satisfactorily determined. This genus is small, as it only contains eight recorded species, of which the writer has discovered two.

It is amongst the *Buprestidæ* family that one can feast the eye on glorious tints and combinations of colours, and this State is well represented by some of the largest and finest of the group, especially in the very large genus *Stigmodera*, which is peculiar to Australia, and contains upward of three hundred species already described, including over fifty for Western Australia, varying from the largest species *S. heros*, down to almost the smallest. Want of space prevents the writer from naming all of them, but reference may be made to *S. gratiosa*, which is fairly common in the Geraldton district, and much in request for pins and brooches. Looked at in a dull light, it is a lovely gold and green, but in the sun it is simply superb with iridescence. There are many other genera here, all well represented, including the richly colored species of *Cœris*, interesting from the fact that it is again represented in South America, more especially *Chili*, whilst the very small species of

Digitized by Google

Anthaxia looks out of place to the casual observer when compared with the giants of the group.

It is probable that the world-wide family of *Staphylinidæ* or "Rove" beetles, will be found well represented here, although possibly of small size.

The family of *Water Beetles* is also fairly numerous, and contains some very small as well as large specimens, and already trouble has been caused by their attacking the young fish and ova which have been introduced by the Acclimatisation Society at their hatchery on the Canning River.

The *Tenebrionidæ* are a very large family of very diversified forms and sizes. In general they are of a black or greyish colour, and are widely distributed and well represented here. One group, the *Helæides*, contains some of the insects most representative of Western Australia, known locally as the *Pie-dish beetles*. These have the edges of the elytra and thorax expanded into a broad rim, covering even the head. One of the largest, *Helæus perforatus*, is nearly an inch and a-half in length. Another, nearly as large, is *H. monoliferus*, or *Wool-bearing*; called so on account of the dense garment of hair on its upper surface. Some of the other genera are beautifully iridescent, rivalling to some extent the *Buprestis* beetles. Mention must not be omitted of the vile smells emitted by some of the genera.

Though not an extensive family, the *Dermestidæ* are perhaps amongst the most destructive insects known in this State, and as if those of local origin were not sufficient, others, only too well known for their ravages among skins, are already firmly established here as immigrants from the "Old Country," of which two species—*Dermestus cadavarinus* and *vulpina*—can be obtained in hundreds among skins, bones, or other dried animal matter.

One of the largest families is the great family of *Weevils* or *Curculionidæ*, over 1,200 species of which are already described for Australia, while it can be safely asserted that nearly as many more are waiting to be classified, it being borne in mind that of the greater number of representatives of the vegetable kingdom each has its attendant weevil, some, as the Acacias and Eucalypts, having special kinds peculiar to them. This State is unfortunately already all too well favoured with indigenous specimens of this species, and it is more than probable that a further supply will ultimately find its way here. Two particularly destructive specimens are the corn weevils, *Calandra oryzæ*, and *granarius*—both introduced—which can be seen at times in hundreds amongst rice, maize, and wheat. Some of the largest and most familiar of these insects are so hard that one can, without hurting them, tread upon them, or even pass a heavy roller over them, unless the ground happens to be particularly firm and solid. Along the banks of the Swan River nearly the whole of the Eucalypts are covered with very large galls, occasioned by one of this tribe, *Strongylorrhinus ochracea*. One gall specially measured was 15 inches long by two in diameter, and contained scores of the

Digitized by Google

larvæ. Fortunately, however, these larvæ are a favourite food of parrakeets and cockatoos, who are experts in extracting them.

Another great family of plant feeders is the *Chrysomelidæ*, represented by hundreds of species. These, though small in size, are of varied shapes and colours; some of them being most brilliant and highly burnished, look like jewels on the foliage. A peculiarity in their favour, as compared with other families, is that they have a pleasant musky odour. One of the largest genera is *Paropsis*, of which there are very many fine species, but unfortunately for the entomologist, the greater number of the richest coloured fade at death to a pale yellow, and out of hundreds pinned probably not a single one will retain the living colours.

The last family to which we can refer is the immense one of the *Longicornia*, which also depend on the vegetable world for their sustenance. They may be classed as the most destructive group represented, and, as before mentioned, some of their larvæ have been found to take over five years to mature. During that time they have in some cases utterly ruined as much as twenty feet of timber with their tunnels or galleries, whilst in other cases young trees have been attacked and completely destroyed. This family is divided into three sub-families, of which the first, or *Prionidæ*, is but poorly represented in Western Australia, possibly by about a dozen species at most, this group being always more numerous in colder parts; still, those that are represented are fine specimens, though not comparable to the giants of South America and India. The next, the *Cerambycidæ*, is a very numerous family, and contains many interesting forms, some of which are great mimics of other families, and also of totally different orders. One genus, *Hesthesis*, which is fairly common at times on flowers, so much resembles a wasp, that it commands the greatest respect from children, and even grown-up persons. Taking the vast area of this State into consideration, it is more than probable that this genus will muster quite a hundred species when all are known. The last sub-family, the *Lamiides*, contains a number of fine insects among the *Penthea*, *Rhytiphora*, and *Symphyletes* genera, fully equal in every respect to those of the other States. Some of this group are of large and stout build, as well as being conspicuous in their colours, and easily recognised, whilst others are very small, and of such protective colours that it is a very difficult matter to see them. Although all the other families cannot possibly be here referred to, it may be stated that they are mostly well represented by fine and interesting varieties, and it is probable that in this order Western Australia will more than hold her own against any other part of the Commonwealth.

Collectors of the *Orthopterous* order will here find many extra large and highly-coloured forms amongst the several families which compose it. The *Forficulidæ*, or *earwigs*, are very numerous in parts, but the species may prove limited, as only four varieties have as yet been observed. The *Blattidæ*, or *cockroaches*, however, amply atone for this, as they are very numerous and rich in forms, some of

Digitized by Google

them being also of immense size. There are also one or two introduced species as well, which have been very widely distributed, owing to the shipping facilities. The *Mantidæ* contain a number of fine varieties, *M. fusci-elytra* being one of the largest species; these are generally known as "*Praying*" *Insects*, owing to their habit of resting with the fore-legs folded, as if in an attitude of devotion. But woe betide the unfortunate insect, even if their own kindred, that ventures near them, as it is instantly seized and devoured. The *Phasmidæ*, or *Stick-and-Leaf Insects*, contain some of the largest insects known, and there are some grand varieties here, fully equal to those in any part of Australia. The violet-shouldered *Phasma Podacanthus violascens* attains a length of six inches, with an expanse of wing much greater. The crimson-winged *P. typhon* is even larger still, but the giants are those contained in the *Diura* genus. *Crickets* are fairly numerous, and contain some peculiar forms; one of the largest, *Deinacrida*, is most formidable looking, having great spiny legs, and enormously long antennæ (nearly nine inches), and with its immense jaws it can inflict a very sharp bite. The true *Grasshoppers* contain some fine species, but are far below the *Locusts* in point of variety; the latter tribe contains many species peculiar to Western Australia, and numbers found in the other States, one of the largest being *Oposmala sordida*, or the "*Dusky*" *Locust*.

The *Neuroptera* will be found widely distributed throughout this State, and are very rich in forms, although only a few can be referred to. *Dragon flies* are numerous and diversified, both as to size and colour, which remark also applies to the *Myrmeleoninæ*, or *Ant-lions*, these latter being finer and observed in greater variety here than in the Eastern States. The large *Nemoptera extensa* is also to be observed here, together with a few species of *Ascalaphus*.

Silver-fish or *Lepisma* are everywhere, some of them being upward of an inch in length. This order is best represented locally by the *Termites*, or, as they are called, *White-ants*, whose depredations are unfortunately known to all; they are one of the most destructive pests to be found, as there is scarcely a timber which they will not attack. The jarrah is said to be proof against them, but it is frequently seen completely riddled by them. One thing which must be admitted after careful observation, is that, where jarrah is used in conjunction with other timber, it is the last to be attacked.

The order *Hymenoptera* is doubtless one of the largest. It may possibly even rival the *Coleoptera* in numbers, and the structure and also the habits of the insects composing it are the most varied of any known, whilst as regards intelligence, they must certainly be placed at the head of the "Insect World." This order is divided into two sub-orders, *Hymenoptera Terebrantia*, in which the ovipositor is used as a borer, and the *Hymenoptera Aculeata*, in which it is modified into a sting. Both divisions are amply represented here by hundreds of species, many of which compare most favourably with those from any part of the world. The first division is best

Digitized by Google

illustrated by the *Saw-flies*, which comprise some large species, over an inch in length, and more than two in expanse of wing. One of our largest is *Perga dorsalis*, of a rich metallic blue colour, with deep yellow scutellum, which is raised, and looks like a plate attached to the insect. The larvæ of this genus are, in their season, sure to attract attention, as they congregate in bunches of 15 to 20 on the young suckers of the Eucalyptus, and when disturbed bend their bodies in the form of an arch and emit from the mouth a greenish fluid which has a remarkably powerful odour of the leaves from which it is distilled. These caterpillars, as the colonists call them locally, are often over two inches in length, velvety black in colour, and covered with numerous short white hairs; fortunately they are much attacked by a *Dipterous* fly, which is parasitic on them, and greatly thins their numbers.

In addition to the *Saw-flies*, this division comprises some seven or eight families of *parasitic insects*, including the *True Gall-flies*, which may be observed almost everywhere. As mentioned above, some galls are produced by Beetles; others, however, are the work of a very large family of small gnat-like flies (*Cecidomyiidæ*), largely represented here. Other families of this order are parasitic on most of the other orders; many attack the larvæ of butterflies, moths, beetles, flies, and some even their own kindred, while some of the very minute *Chalcididæ* prey even on the eggs. As an illustration of their small size, it may be mentioned that a fine lot of eggs of one of our larger moths (*Darala*), which the writer found and took home to be hatched so as to enable him to observe what the young caterpillars were like, yielded, instead of the larvæ of the *Darala*, a number of those of the *Chalcididæ*. The eggs measure about a twelfth part of an inch in length. Some of the insects in this division have very long ovipositors, one recently measured being nearly three inches.

Among the second division will be found one family which seems to be universally distributed, the *Ants*, whose name is legion, and to whom, as is only too well known to the housewife and bushman, no place or thing is sacred. The large *Soldier Ants* are often over an inch in length, and can inflict a most painful sting, as the writer can personally vouch for. Their sting, however, is less severe than that of the species known as the *Jumper*, whose venom is far more acrid and painful, although the "Jumpers" are not more than half the size of the "Soldiers," some species known locally being less than an eighth of an inch long. The colours of ants are very varied; there are reds, yellows, browns, metallic blues, and greens, also numerous blacks, including a small but most persistent little insect, which, when opposition is offered to its entering a house or tent, is only too eager to attack back, not only by very sharp painful bites, but also by emitting a most disagreeable odour. Amongst others there are *ground-dwelling ants* and *arboreal ants*, *mason* and *carpenter ants*, *leaf-cutting* and *harvesting ants*, *agricultural* and *stock-keeping ants*, *honey* and *sugar ants*, as well as *slave-making ants*. Names have not

Digitized by Google

been quoted, as the writer is not aware of any authority on Australian ants excepting in regard to one or two species.

Of the *Wasp* tribe there are here an immense number and variety, including some very large species in the *Thynnidæ*, *Scoliidæ*, *Sphegidæ*, and other genera. The males of the *Thynnidæ* are easily recognised, as they are frequently to be seen crawling over the native shrubs when in bloom, a particular favourite being the paper bark (*Melaleuca*). They are of several colours; black, black with yellow bands, and black with orange red. The females are seldom seen, being wingless, and greatly resembling stoutly built ants. There are probably thirty species of this genus alone here. It may be added that the formidable looks of the male insect command the greatest respect from the colonists and their children, by whom they are erroneously credited with the possession of fearful stings; it is to the females only that this form of protection is given. In the genus *Mutilla*, or sand-burrowing wasps, the female is also wingless, the male being, as a rule, quite unlike his lady love. It is, however, a difficult matter to capture them in order to be certain of the species. Another strange characteristic of the *Mutilla* genus is that the males have long straight *antennæ*, while the female has hers much shorter, and often twisted. The *Scolia* are rather handsome insects, with smoky or steely-blue wings, metallic black or blue, hairy bodies, with yellow spots, or collar, or bands; they will sting severely if handled, but are far less numerous than those previously mentioned. These insects should not be destroyed as they provision their nests with the larvæ of some of the most destructive beetles (*Melonthidæ*). The *Sphegidæ* must be familiar to all dwellers here, if only from the nuisance they make themselves by building their mud nests in keyholes and other inconvenient places. Some of them again affix their nests to the walls of houses, where they are very conspicuous objects. The writer counted nearly a hundred of them on one house recently. These insects, although we possibly may not recognise it, are undoubtedly of very great benefit to us, from the great number of noxious insects of other orders which they destroy and devour. Some of them provision their nests with grasshoppers, others with spiders, flies, or caterpillars. It is a particularly interesting sight to watch them hunting for their prey; no wolf hunts with a more relentless purpose than they do, and it is but seldom that they are not the victors. This State does not seem to be very rich in the "*Social Wasps*," as only a few nests have so far been observed, but there are some that utilise the old galleries of the *timber-boring beetles*, to construct their nests in.

Want of space prevents the mention of more particulars concerning the members of this interesting tribe, as otherwise no room would be left for the *Bees*, with which the State seems to be well supplied. There are, it is said, over fifty species in the British Museum from Western Australia, comprising quite a dozen genera. One of the largest is the *Carpenter Bee (Lestis bombylans)*, which is widely distributed. It is of a bright metallic

Digitized by Google

green colour, and very hairy. Its nest has been found in decaying timber. Another, common in the Swan River district, is the *blue-banded bee (Anthophora pulchra)*, one of the handsomest species. A bee most strongly attached to one special food plant is the *silver-faced bee (Lamprocolletes argentifrons)*, which seems very numerous, wherever the *Stinkwood (Inula graveolens)* grows. Two or three species of the "*leaf cutter*" *bees* (*Megachile*) appear to be very numerous around Perth, as shrubs, including roses, and flame trees (*Brachychiton*) are frequently to be seen with scarcely a sound leaf left on them.

This all too brief notice should certainly not be closed without referring to the *Chrysididæ*, whose brilliant colours fill the observer with admiration, as their fiery tints scintillate, like a blaze of jewels in the sun. They are rather small, slender insects, with a hard abdomen, convex above and concave below. The females carry a very acrid sting, and are wonderfully active in the hottest sun. They are parasitic insects, their larvæ living on the living larvæ of bees, wasps, and others of the order. The eggs, however, are not laid within the body of their victim, as is the case with the vast army of the *Ichneumons*.

The Order of *Lepidoptera* in this State, as far as we know at present, is not rich in "*Butterflies*," and although the number may prove more extensive as the Central and Northern parts become better known, it is greatly to be feared that the Western Australian record will always show a smaller number than that of any of the other States. The *swallow-tails* (*Papilio*) are represented by the fine *P. sthenelus*, which was fairly numerous around Perth last autumn. There may be other species, but this is the only one observed by the writer. The *Danainæ*, likewise, have one representative, *D. petilia*, which has a most extensive range. *Pieridæ* are better represented, there being six species known at present. The *Satyrinæ* or *Brown's*, contain six species, included in two genera. One of them, *Xenica achanta*, is unrecorded for this State at present, but widely distributed over all the others. *Nymphalinæ* has only two genera, containing three species. *Pyrameis itea*, our only "*admiral*," is distributed over the whole continent and Tasmania, even extending beyond. The *Painted Lady* (*P. cardui* var. *Kershawi*) was no doubt originally introduced, as the chief point of difference between the European *P. cardui* and our form seems to be that while the four spots on the posterior wings are black in the European, in ours three out of the four have very decided blue centres, which seem constant; it was therefore proposed to distinguish it as a sub-species *Kershawi*. This is by far the commonest of our butterflies, but is nearly approached by the pretty *Junonia vellida*. The *Lycænidæ* are of world wide extent, and contain some of the most beautiful butterflies, but as the local species are not yet sufficiently known, all that can at present be said about this pretty family is that they are not very numerous. The last family of *Skippers* (*Hesperidæ*) contains some pretty forms, but small in size. One genus confined to the State is very peculiar *in its habit of* always resting with the

Digitized by Google

wings expanded; like the moths, it is a conspicuous insect in flight, but very deceptive on the ground, and seems much nearer to bridging the gulf between the butterflies and moths than any with which the writer is acquainted.

The *Heterocera*, or *Moths* proper, are far more numerous than might be supposed, as so many species will only take wing in the day time when actually compelled. Many of the *moths* are of large size and great beauty; it is more than probable that a large number of them will prove forms that are unique and peculiar to the State. In addition to the great number of indigenous species, we have, unfortunately, numerous introduced kinds, all noted "pests," such as the *bee-*, *clothes-*, *potato-*, *cabbage-*, and *vine-moths*, whose evil reputations are unluckily not improved by the splendid West Australian climate, which enables many of them to rear an extra brood. The *cabbage-moth (Plutella cruciferarum)* is a fearful scourge in this district (Swan River) and may interest some, from its being distributed over the whole world, from Greenland to New Zealand, and from its appearing to be, according to reliable authorities, the only representative of the *Lepidoptera* in Spitzbergen. The writer's acquaintance with this group is all too limited, but as far as careful observations go, he will risk the opinion that most of the families will be here well represented, especially in the timber-boring section which contains some very large and beautiful species in the *Hepialus*, *Trictena*, and *Zeuzera* genera. The immense caterpillars of these are well known to the aboriginals, with whom they form a staple article of diet, as likewise do a great many of the larvæ of the *longicorn beetles;* the larvæ are very numerous, but owing to so many being consumed by the natives the perfect insects are very rare. The writer has only noted three species of *Hawk-moths*, of which two are introduced. Our commonest is the "*silver-striped*" *Chærocampa celerio*, whose large caterpillars feed on the vine and "pig-lilies" (*Calla æthiopica*).

The males of the *Teia Anartoides* are beautiful little objects, whilst the females, which vary considerably in size, and are locally called "spiders," are wingless. The writer, to ascertain the fecundity of this interesting order, carefully counted the eggs, laid on the silky covering of the pupa case, of three specimens; these in one instance numbered 703, in another 675, and in the third 633. This species also affords an instance of a native insect forsaking its natural food, the Acacia, for introduced trees, as it has frequently been observed in the Perth district feeding on the leaves of the rose, apple, and quince.

Of the *Hemiptera* (*Bugs*) we have unfortunately a very large number of plant-feeding species, varying greatly in size and colours. One large species, *Myctis profana*, which feeds on the wattles (*Acacia*), can be observed almost the whole year through, in hundreds, wherever these trees grow. At times, the numbers on one plant are sufficient to almost kill it, so great is the quantity of sap abstracted. This insect is easily recognised by its greyish-brown colour, and a large white X on its back. The larva, however,

Digitized by Google

is totally unlike the imago, the insect in its former condition being of a reddish-orange colour, with blue-black markings. Then there is the *Harlequin bug* (*Dindymus versicolor*), which appears in great numbers at times, and is conspicuous in colour—orange-red and black. This pest has taken to attacking apples in Victoria, so there is every probability it will do so here later on; if handled it emits an offensive odour which clings to the fingers for some time, a peculiarity characteristic of bugs in general. Another very small species of the numerous genus *Rhyparochromus*, which is of a light green colour, tinged with red on the wings, commits great havoc on sunflower plants in the Perth district; it can at times be seen in thousands on one plant, and in such cases causes the production of deformed flowers and leaves.

The State is also well represented in the *Reduviidæ* or *carnivorous bugs*, which are of many sizes, but not so varied in colour as the above. These insects kill and suck the juices of a great number of others, among which have been observed cockroaches, crickets, locusts, beetles, flies, and some of its own species. One common here, *Reduvius sp*, can often be observed extracting the contents of one of our far too numerous caterpillars, the larvæ of *Heliothus armigera*, a moth which has spread almost over the whole world. Another most obnoxious member of this order is the genuine *bed bug* (*Cimex lectularis*), which is either an introduction from its original home, Africa, or may have come from the mother country, where Westwood mentions that it is recorded as first appearing in 1503. Cockroaches are said to be especially fond of them, but one can hardly recommend that these should be specially encouraged for the purpose of destroying bugs, as it is questionable which of the two evils is the worse. The *Nepidæ* or *water bugs*, often called "*water scorpions*," from the resemblance which their great, long, raptorial front legs bear to the claws of the scorpions, contain the largest members of the tribe.

The sub-order *Homoptera* contains some of the most curious and interesting forms in the different families of which it is composed, such as the *Cicadas*, whose unpleasant stridulating screech is kept up, as Falstaff says, with "damnable iteration" the whole day long, during the hottest months of summer. There are a few of the curious "*Candle Flies*," but they are of small size, and not so brilliant as the South American and Indian forms. Amongst the *Membracidæ* are found a vast number of extremely curious insects, which unfortunately are so small and protective-coloured as to be but seldom noticed. One is astonished at the extraordinary shape assumed by the pro-thorax, which in many cases is prolonged beyond the body. The *Cercopidæ* or *Froth-hoppers* are fairly represented by a number of brightly-coloured but small species. *Aphidæ* or *Plant Lice* are numerous, as are the *Psyllidæ* or *gall producing bugs*. The *Scale Insects* or "*Coccidæ*" are unfortunately too numerous, even without the many introductions which have taken place, as *San José-*, *Oleander-*, *Apple-*, and *Cottony Cushion-Scale*, and several others. *The curious Paradise flies* (really bugs),

Digitized by Google

are often observed flying about at the end of summer. They are small, slender insects, with chitinous wings, and the anal extremity of the male is decorated with a long tuft of silky filaments, resembling spun glass. The great gravid female would make half a dozen of her lord; she is quite blind, of a dirty brown colour, and may be frequently observed clinging to the stalks of grass or rushes.

The almost numberless order of *Diptera*, or *Flies*, is too well known to require any introduction, and this State certainly seems to have her share. Should any collector take this Order in hand, he would find abundant occupation for some considerable period, and would certainly reap a rich reward for his labours. Only a few of the families can be noticed, and as the Australian genus *Rutilia* contains some of the most brilliant flies known, it shall be placed first on the list. There are several species of these lovely creatures, some over half an inch in length, resplendent with beautiful metallic or rainbow tints. The group of *meat-* or *flesh-eating flies* also contains some beautifully coloured species. This group is one of the greatest pests the State has, for its members do not wait for a wounded animal to die, but attack it whilst still living, and in many instances cause death, which, but for them, might not have ensued. The *Hovering Flies* (*Syrphidæ*) are very numerous in this State, and some are very large. *Gad Flies* also are numerous, and at certain seasons make their presence known by the sharp punctures they inflict on the hands and face, especially in the case of one species which greatly resembles the common fly. *Robber Flies* (*Asilidæ*) are very largely and conspicuously represented, many of them being of considerable size. One of these is very partial to the hive-bee, of which it must destroy large numbers; it captures its victim on the wing and transfixes it, then, settling on some tree-trunk or fence, it sucks the juices out of its prey; this ended, it drops the carcase and renews the chase. Another large species has been often observed feeding on locusts, and should this prove to be its only food, it is well deserving of protection. Some again attack beetles, whilst numbers of the smaller kinds feed on flies. Before leaving this order attention must be directed to the *Bot Flies* (*Œstridæ*) which are far more numerous than is generally supposed. In fact, many stock-owners do not as yet believe in their presence in the State. They can, however, be easily shown to be in error, for *post mortem* examinations on the horses killed at the Zoo furnish the alarming result that bots, numbering in some cases over 70, have been found in the stomachs of seven out of every ten examined. Stable-fed horses appear as a rule to be rather less subject to bots than those that are grass-fed, but even they are often found to have them in smaller numbers. After very careful observation by the writer, in only one case has the outer lining of the stomach been found to be perforated, and even in that case it had healed again. This fact is mentioned, because bots are commonly believed to cause the death of any animal they attach themselves to. The writer is at the present time endeavouring to perform the very difficult task of breeding the perfect insect, and as soon as he is successful he will

Digitized by Google

present the "life history" of this pest to the Stock Department and Museum of the State, so that it can be brought under the immediate notice of all directly interested. Unfortunately, in this State other specimens of this genus also occur; these attack the frontal sinus and nasal cavities of sheep and cattle, and come more immediately under notice when the perfect insects are flying among sheep. On such occasions the sheep may be noticed standing round in circles on any barren sandy spots that may be available, with their heads close together, and with nostrils nearly touching the ground, while they keep stamping the front feet seemingly in order to raise a dust, which is evidently objectionable to the flies. It may possibly be of interest to state that man himself has been attacked by bots in Europe, and that an *Œstrus* considerably over an inch in length has been obtained from the body of a common mouse. *Sand Flies* are all too numerous here, and seem to have a peculiar liking for attacking one's ankles. *Mosquitoes* are at times almost unbearable, even to the seasoned dweller, but far worse to the new arrivals. They are of several kinds, sizes, and colour, and some are especially venomous. The *Gnat* and *Daddy Long-legs* tribes are numerous, as also are the *Gall-flies*, whose operations are conducted on different genera of Plants. *Parasitic flies* on other orders, especially *Moths*, are numerous, and four or five species may be obtained from some caterpillars.

Ticks are largely represented, including the dreaded *Cattle tick*, which is about the largest species. Snakes and Lizards are often infested with closely allied forms, as are also various species of birds and poultry.

Fleas (pulex irritans) are prolific beyond measure during the spring months.

Though not true insects, *Scorpions* may here be mentioned as numerous; some of the species attain a fair size, and all are to be avoided, as they can inflict a severe and painful sting.

Spiders also are as well represented here as in any part of the world; and amongst them are found some of the most fantastic shapes imaginable. Although there are none so large as the *Giant bird catching spider* of South America, there are yet among the *Trap-door-* and *Wolf-spiders* some very large species, capable of inflicting exceedingly painful bites. One genus, *Latrodectus*, is represented by two known species, perhaps more, the one jet black with a broad stripe of vermilion on the abdomen; the other has a spot of vermilion in place of the stripe, and the central parts of the legs are also red. They generally appear to haunt rubbish heaps or are found under logs and in other places, and are exceedingly venomous, the venom being stated to be worse than prussic acid. Some spiders construct dwellings with trap-doors of such marvellous ingenuity as to almost defy detection when the doors are closed. Few species of water-spiders have as yet been noticed, but it is probable that there may be a great number scattered over so vast an area as is included within the confines of the State.

Digitized by Google

9.—FLORA.

The Vegetation of Western Australia.

(By A. Morrison, Esq., Government Botanist.)

The flora of Western Australia is distinguished for its richness, the beauty of its flowers, and, in many instances, the singularity of the forms composing it. The number of species of extra-tropical vascular plants recorded in the late Baron von Mueller's sketch of the vegetation of Western Australia, published in the "Year Book" issued in 1896, is given as 3,700, but additional species have been discovered and recorded since that date, though not yet brought together from the scattered publications in which they were described. If those of the Northern portion of the State are added—over 2,000 species being found in those parts of Western and South Australia North of the Tropic of Capricorn—the number of plants existing in Western Australia will be seen to be very large. A great variety might be expected on account of the immense extent of the territory of the State, which ranges from about 14° to 34½° South latitude; but it is in the temperate regions that the great abundance of plants is met with. In Queensland, which stands next to Western Australia in the number of species, the flora has been enriched by the incursion along the North-East coast of many forms of vegetation from the Malayan and Oceanic regions; but these, owing doubtless to different climatical conditions, are absent from corresponding latitudes on the Western shores of the continent.

While the vegetation of the tropical region is not specially distinguished, alpine vegetation, on the other hand, is entirely wanting in Western Australia, on account of the absence of high mountains and the permanent streams and still waters usually associated with them. The remarkable profusion that characterises the flora is therefore, as already said, to be sought for in the temperate latitudes, and is found in the South-West Division of the State, or within the triangle formed by a line from about the mouth of the Murchison River to the neighbourhood of Esperance, with the West and South coastlines between these two points. Sandy soil in Australia generally is more prolific as regards variety of plants than that of richer quality, but the exuberance of flowering plants in the South-West of Western Australia, where the soil is sandy to a very large extent, is correlated also with a copious rainfall, and at the same time with underground supplies of water at shallow depths, without which the native flora as well as the cultural conditions of the soil might be very different. Under the influence of the winter rainfall and the increasing warmth of spring, numerous plants make their appearance above ground that formerly was bare or thinly covered with shrubs or trees, and after a short but brilliant course ripen their seeds and die down, giving place to

Digitized by Google

others that speedily come to fruition also. There is thus a continual succession of flowers, one series following the other till near midsummer, when the surface soil even of the swamps has become more or less desiccated, with hardly a trace remaining of the abundance that for the previous three or four months had graced the scene. For brilliancy of colouring the native flowers cannot be surpassed, and the peculiarities in the formation and structure of many add to the interest with which they are regarded by residents, and still more so by visitors from other countries.

From the fact that so large a number of species exist in the comparatively limited South-West Division of the State, it would naturally be expected that each different portion of that area would be tenanted by a considerable number not found in the other portions. As a matter of fact, taking the neighbourhood of Perth as a starting point, we find that its flora, while very copious itself, is wanting in many of those that abound on the Darling Range, 15 miles or so to the East. The flora of the York district again—which was at an early date named the Garden of Australia—contains a still larger number of species not met with near Perth or on the Darling Range. Still further East, in the hot and arid interior, many plants characteristic of the desert are to be found, strangely modified in many cases in order to withstand the inhospitable climate of those parts. Passing North from Perth, towards Geraldton, we see also great differences in the native vegetation, and changes will be observed to the South of the Swan River, especially at the extreme South-West corner of the island-continent and the South coast towards the Great Bight, where in a very rich flora a large number of species are endemic, or entirely confined to those districts. Many are so restricted in their distribution that there is a great risk of their being exterminated at an early date.

The influence of climate on the distribution of plants is very important, but in the differences between the vegetation of Perth and that of the Darling Range, the part played by the constitution of the soil is probably of more consequence. The rainfall is similar in the two districts, and the difference in elevation above sea-level would be no bar to the plants of either district growing in the other; but in the one case the soil consists almost entirely of sand or sandy swamps, overlying limestone and sandstone of Mesozoic age, while in the other the soil on and near the hills is derived from igneous rocks, and is richer and more retentive of moisture.

The earliest colonists of the Swan River settlement were struck with something like wonder at the prolific character of the soil there, composed as it is for the greatest part of almost pure sand; and they recognised that it was due to the presence in the subsoil of abundant moisture. This subterranean supply of water, met with everywhere between the ranges and the coast, must be as old-established as the hills themselves, from which we may presume it is to a large extent *derived; and judging* from its existence and

Digitized by Google

effects at the present day, we can estimate its influence in the development and preservation of the singularly rich and highly peculiar flora we now see. The South-West Division of the State, favoured with this means of resistance against drought, may have been for long ages a harbour of refuge for the reception of plants driven by stress of untoward environment from a much wider surrounding area.

Special adaptations, in the form and structure of plants, are common in Australia, where the climate generally is very dry, and sometimes of great severity. A striking feature of the flora is the number of spiny plants, in the foliage of which the amount of cellular tissue, and the surface area of the leaves, are greatly reduced, so that the softer parts of the blade disappear more or less, while the ribs remain hard and woody, ending in sharp points. This structure of the foliage is adapted to the condition of the soil and the atmosphere—a function of the leaf, the soft cellular portion especially, being to exhale into the air the moisture absorbed from the soil by the roots of the plant. As the soil, particularly in desert regions, is very dry, the root-system, even when largely developed as it often is, cannot absorb much moisture, while the dry atmosphere is ready to take up all and much more than the vegetation can supply to it by transpiration. The demand made by the dry air is so great, and the supply of moisture in the soil so meagre, that the amount of transpiring foliage must be reduced to the lowest limit in order to preserve the balance, and allow the plant to utilise the scanty supply to the greatest advantage. Reduction of foliage may also be seen in short scale-like leaves, and in the great majority of acacias the true leaves are suppressed, all but the leaf-stalks, that assume a flat leaf-like form, and are known as *phyllodia*. It may be pushed as far as entire suppression of the leaf, and in such cases leaf-functions may be carried on by the stems of the plants. Among desert plants, as in many *Verbenaceæ* and *Solanaceæ*, a dense coat of hairs covers the leaves or the whole plant, while in others, as in some acacias, the surfaces of leaves and twigs are varnished over with a layer of resin, both modifications having much to do with the control of the rate of transpiration, but serving also as a protection against the extremes of heat and cold to which they are subjected.

While the vegetation of Australia as a whole is highly differentiated from that of the rest of the world, Western Australia is more specifically Australian in this connection than any of the other colonies of the group. Baron von Mueller reckons that of the 3,700 species found in the extra tropical part of the State, 2,460 are endemic, or not found anywhere else. There is no such admixture in its flora—as obtains to a greater or less degree in the other States—of species derived in the course of past ages from almost all other regions of the Globe, so that Western Australia, as regards its flora, is typically and purely Australian. As the vegetation of the different parts of the world must presumably have had a common derivation in the remote past, it could hardly be

Digitized by Google

expected that the larger divisions of the vegetable kingdom, or the families of plants, would be distinct even among those occupying the most remote divisions of the Globe, but in Australia there are natural orders that are endemic or almost so, being distinctively Australian and entirely confined to Australia, or represented elsewhere only by one or a few outlying species, mostly in adjoining regions. Such are the *Tremandreæ*, *Stackhousiaceæ*, *Stylideæ*, *Goodeniaceæ*, *Casuarineæ*, and *Philhydreæ*. It is indicative of the high antiquity of the Australian flora that the observations of Dr. Treub, of Java, made not many years ago, on the embryogeny of the *Casuarineæ* or Sheaoaks, prove that that family shows fundamental differences from the great division of *Angiosperms*, leading him to propose a partition of that large class into *Chalazogamæ*, represented by the *Casuarina*, and *Porogamæ*, including all the rest of the division.

In other orders many genera, and even groups of genera, are exclusively Australian, while the number of endemic species is very large; and Western Australia has the largest share of these endemic plants. The explanation of this is believed to lie in the long continued isolation from the rest of the world of Australia, and especially of the South-West corner of the continent, a region new as regards human associations, but of remote antiquity and older than most other parts of the world as regards the distribution of sea and land, and the forms of animal and vegetable life inhabiting them.

In connection with the external relations of the Australian flora, the affinity it bears to that of South Africa should be mentioned. Between the two there is a general resemblance as regards some of the natural orders, and at the same time also a general dissimilarity. For example, *Proteaceæ* and *Restiaceæ* are both well represented in each, while little known in any other part of the world, but very few of the genera and none of the species of these orders are common to the two countries. On the other hand the plants of some orders are plentiful in the one country, but absent or only sparingly represented in the other; the *Myrtaceæ*, for instance, being numerous in Australia but rare at the Cape, while the *Geraniaceæ* are extensively developed in the latter country, but uncommon in Australia. The *Epacridaceæ* and *Ericaceæ* illustrate at once the similarity and the dissimilarity spoken of, for the two orders are closely allied to one another, and while the former are almost exclusively Australian, the latter attain their fullest development in South Africa, and are illustrated by only a small number of forms in the Australian region, and not at all in Western Australia. A feature common to the vegetation of these two regions is the presence in each of numerous minute plants, from less than an inch to several inches in height, associated with and evidently dependent on similar physical and climatic conditions in the two countries. These interesting forms are abundant in Western Australia, though apt to be overlooked by those who do not search for them.

Digitized by Google

Whether any land connection ever existed between the Cape and Western Australia or not, by which the likeness between the two floras might be explained, it is certain that there was frequent communication by ship between the two in the early years of the Swan River settlement. This form of connection resulted in the introduction of a considerable number of South African plants into the State, now naturalised and adding to the gaiety of spring time, though in some cases proving troublesome pests and difficult to eradicate.

The following notes on the native plants comprised in the principal natural orders will indicate some of the salient features of the West Australian flora.

The *Leguminosæ*, if we except the acacias, are not distinguished for economic value, although in other parts of the world, and as cultivated plants, their products are of the greatest importance to mankind. A considerable number of species, on the other hand, are poisonous to a virulent degree, and are the cause of great losses of cattle and sheep. Beautiful plants, however, abound in the order, and many species of *Chorizema*, *Oxylobium*, *Gastrolobium*, *Gompholobium*, *Bossiæa*, *Hovea*, *Crotalaria*, *Swainsonia*, *Kennedya*, *Clianthus*, *Cassia*, and *Acacia* have been in cultivation from early dates, though now out of fashion. The acacias are very numerous, and furnish not only ornamental plants, but good timber, tannin, and gum.

The *Myrtaceæ* are very copiously represented in Western Australia, and a considerable number of the genera, as well as numerous species, are endemic. The Eucalypti, or Gum trees, as in other parts of Australia, are the predominating element in the forest vegetation, and some of the most valuable kinds occupy immense areas. Besides being, on account of their timber, one of the chief sources of wealth in the State, some species of Eucalyptus are very ornamental, and of these may be mentioned two Southern species of restricted distribution, namely, *Eucalyptus ficifolia*, the scarlet-flowered gum, and *E. tetraptera*, and there may also be added a new species from Coolgardie, recently described by Mr. J. G. Luehmann, under the name of *E. torquata*. The foliage of the Eucalypti, and of myrtaceous plants in general, is permeated with glands containing essential oils of various qualities, and useful for therapeutic purposes, perfumery, etc., while the Conservator of Forests has recommended the utilisation of the waste Jarrah timber for charcoal making. (For an account of the chief timber trees of this and other orders, *see* article on Forest Resources.) Large numbers of the plants of this order adorn the landscape with their beautiful flowers, and they are eminently suitable for greenhouse decoration. Species of *Darwinia*, *Verticordia*, *Calycothrix*, *Lhotzkya*, *Baeckea*, *Hypocalymma*, *Kunzea*, *Melaleuca*, *Beaufortia*, and *Calothamnus* may be mentioned as some of those worthy of cultivation.

In the great family *Compositæ* we have daisies (*Brachycome*) and everlastings (*Helichrysum*, *Helipterum*, *Waitsia*) and others, in

Digitized by Google

profusion all over the State, making brilliant extensive areas, and they are, perhaps, the most generally popular of all the native flowers.

The *Stylideæ*, or *Candolleaceæ*, as the order was latterly named by Baron von Mueller, are popularly known as "trigger-plants," on account of their irritable style. The genus *Stylidium*, or *Candollea*, is represented in the State by no fewer than 64 species, nearly all endemic, and a large proportion of these, besides being of curious structure, have flowers of lovely and various tints, and are often mistaken for orchids by the inexperienced.

The *Goodeniaceæ*, like the *Stylideæ*, are characteristically Australian, and are represented in the West by some of the most showy of flowers: species of *Leschenaultia*, *Dampiera*, *Goodenia*, and *Scævola*.

The *Epacrideæ*, or Australian Heaths, contain a large number of ornamental shrubs, of the genera *Styphelia*, *Conostephium*, *Lysinema*, *Andersonia*, and *Sphenotoma*, admirably adapted for garden or greenhouse, but greatly neglected like most other native plants.

In the *Myoporinæ* we have an order almost wholly confined to Australia, and of the two genera composing it, the *Eremophilas*, or Desert Prides, are numerous and ornamental.

The *Salsolaceæ* or *Chenopodiaceæ* contain plants of great value as fodder, and are found in the arid interior of the State especially, supplying large quantities of succulent foliage at seasons when little else is available for stock. Species of *Atriplex* are the main source of this fattening fodder, but *Kochia* and *Rhagodia* also furnish supplies. The branches of the plants are so brittle that the continuous and unrestricted access of cattle results in their extermination sooner or later. This treatment of the bushes supplying the most natural and suitable fodder in the back country is wasteful and improvident, and squatters are now coming to recognise that the saltbushes are worth preserving, by avoiding the overstocking of their runs, and by propagating the plants from seeds and cuttings planted in enclosures where the branches can be cut when full grown, and thrown over the fences to the cattle or sheep as required.

The *Proteaceæ* form an order of plants characteristic of Australia, and most fully developed in the West. A large proportion are shrubby with rigid spiny foliage, but the flowers are generally brilliantly coloured and curious in form. The Banksias and Dryandras include shapely, though small trees, ornamented with cone-like heads of flowers, handsome in form and brightly coloured. Though few are of economic value, many, such as species of *Petrophila*, *Isopogon*, *Conospermum*, *Lambertia*, *Grevillea*, *Hakea*, as well as *Banksia*, are desirable for cultivation as ornamental plants, presenting curious and interesting forms of both flowers and foliage.

The *Orchideæ* excite much attention in the State on account of the strange forms and showy colours of their flowers, especially

Digitized by Google

those of the genera *Caladenia*, *Thelymitra*, *Diuris*, and *Glossodia*. All the species are terrestrial.

The *Hæmodoraceæ* contain some of the most remarkable flowers in the flora of Western Australia in the *Anigozanthos*, or Kangaroo Paws, of which there are nine species altogether, showing off more or less prominently their singular flowers clothed in a woolly covering dyed in the richest and most intense colours conceivable. They appear to be easy of cultivation, and the horticulturist might also give attention to some others of the family, as *Conostylis* and *Tribonanthes*, which have more subdued tints and more regular flowers.

In the large order *Liliaceæ* are a number of showy flowers, such as *Thysanotus* (the fringe-lilies), *Sowerbæa*, *Johnsonia*, *Calectasia*. Baron von Mueller includes in this order the genera *Xerotes*, *Xanthorrhœa*, and *Kingia*, placed by other authorities in the *Juncaceæ*. The *Xanthorrhœas* are confined to Australia, and impart a special physiognomic character to the scenery, aided in this State by the *Kingia*, a nearly-related endemic plant.

The *Gramineæ*, or true Grasses, form an important order, and are represented by a large number of species in Western Australia. Among the most valued for pasture are *Astrebla pectinata* (Mitchell Grass), *Anthistiria* (Kangaroo Grass), species of *Panicum*, *Andropogon*, *Agrostis*, *Poa*, *Eragrostis*, etc. Some are of high nutritive value, and the trouble expended in their cultivation, or in fencing off areas to secure seed for the renewal of the pastures, would be repaid with interest.

The *Filices*, or Ferns, as we might expect in so dry a climate as that of Western Australia, are poorly represented in the State, only 15 species being indigenous. None attain the size of tree-ferns, but the place of these in the landscape may be said to be supplied by the *Macrozamia*, *Xanthorrhœa*, and *Kingia*.

Among the useful products of West Australian plants, those suitable for food are insignificant, but it is probable that cultivation and selection may so improve some that they will in time yield produce of value as well as novelty. The Caper plant, *Capparis spinosa*, is a native of the State, as well as of other parts of the Eastern hemisphere, and the Melon is considered by some authorities to have been derived originally from a species of *Cucumis*, identical with a native of the drier and hotter parts of Australia. *Tetragonia expansa*, New Zealand Spinach, is indigenous on our coasts, and *Portulaca oleracea*, *Purslane*, that used to be cultivated in Europe as a pot herb, is also a native, and is a valuable fodder plant during the dry season in arid country. *Microseris Forsteri* and *Dioscorea hastifolia*, have fleshy edible roots that could be greatly improved by means of cultivation. *Vitis angustissima* is a native grape vine that may some day be tried as a hardy stock for the best varieties of grapes. *Macrozamia Fraseri* contains a large amount of farinaceous matter, that only requires to be washed, as with arrowroot or tapioca, in order to dissolve out the poison associated with it, and thus be converted

Digitized by Google

into a wholesome food. The aboriginals eat the fruits of *Marsdenia Leichardtiana*, an asclepiadaceous climber, the seeds of Acacias, the grains of some grasses and of the mardoo, *Marsilea quadrifolia*, as well as other vegetable products, having a more or less meagre store of nutriment.

Poisonous Plants.

Bright and interesting as the flora of Western Australia is, a shadow is cast on it by the poisonous plants that make themselves known by their fatal effect on cattle, sheep, and horses browsing on them. The fact that these plants constitute only a small proportion of the whole flora of the temperate latitudes, and that they are much less prevalent in the tropical districts does not console the settler for the loss of his stock. Some of the species grow in abundance over large areas, and being virulent poisons the loss they cause is very great. A majority of them are comprised in a tribe of the *Leguminosæ*, represented by the genera *Oxylobium*, *Gastrolobium*, and *Isotropis*, with *Gompholobium* as a genus strongly suspected. While suspicion furnishes no proof, there can be no question regarding the deadly effect, frequently demonstrated, of a considerable number of species of *Oxylobium* and *Gastrolobium*. While they are closely allied botanically the poisonous effects of the various species appear to be similar, the main symptoms being griping, delirium, and paralysis, involving the sympathetic system of nerves, with convulsions. Other leguminous genera contain species reputed poisonous, such as *Templetonia*, *Indigofera*, *Lotus*, and though *Swainsonias* of the Eastern States are known powerfully to affect the brain in sheep, the West Australian species do not appear hitherto to have been suspected, and one—*Swainsonia Macculloch-iana*, the Minilya Glory-pea—is at once highly ornamental and fattening as fodder. As the losses inflicted on the owners of stock by the *Oxylobiums* and *Gastrolobiums* are very serious, antidotes and preventives are anxiously desired, and the Department of Agriculture has recently taken steps to have the poisonous action of some of the most prevalent species investigated according to the most exact methods, and with the aid of the most approved appliances.

Other families of plants furnish poisonous species, but only in comparatively few cases has convincing proof been given of their toxic character. *Macrozamia* or *Encephalartos Fraseri* is an endemic cycadaceous species, known to produce the disease called "wobbles," or a false "rickets," due to partial paralysis of the hind quarters of the animal, a result that has been confirmed by experiment. The action of the poison is like that of ergot, spasmodically constricting the blood-vessels; and as the leguminous group of poisons apparently take effect on the blood-vessels by relaxing and paralysing them, it would seem at first sight as if nature had provided in each at least a partial antidote for the other.

Cases have lately occurred of poisoning of children from eating of a solanaceous plant, *Anthocercis littorea*, the symptoms observed resembling those produced by belladonna. *Duboisia* Hopwoodi

Digitized by Google

again, the Pituri of the aboriginals, is used by them to poison emus and kangaroos, and chewed in the same way as tobacco, while it has come into use in ophthalmic surgery as a mydriatic. Both of these plants belong to the *Solanaceæ*, and have a physiological, as well as a botanical relationship with each other, and with belladonna. *Isotoma Brownii* has been found in bush experience and by experiment to be poisonous, and other native Lobelias in the same order of *Campanulaceæ*, are doubtless also dangerous. Some plants, like *Euphorbia Drummondii*, and *Sarcostemma Australe*, the Milk-bush, have acquired a reputation for being toxic, but under other circumstances they have been found wholesome food for stock.

Stypandra glauca, Blind-grass, is, and has long been regarded as a deleterious plant in Western Australia, producing blindness, paralysis, and even death in horses and other animals; but on the Eastern side of Australia, where also it is indigenous, no report has ever been made of its causing illness in animals. *Phebalium argenteum*, one of the *Rutaceæ*, according to Baron von Mueller, has been named the "Blister-plant," on account of the blistering property of its juice. Native plants actually in use as medicine are not as yet numerous; but there may be mentioned *Sebæa* and *Erythræa*, of the order *Gentianaceæ*, as tonics in domestic use, and *Duboisia*, already spoken of as in the hands of professional men. The only native species of Mint, *Mentha suturejoides*, is said to be sudorific, and *Boronias* and *Eriostemons* diuretic, while *Gratiolas* have been used for dropsy. The *Pimeleas*, in the order *Thymeleæ*, have been employed for blistering, and many other plants known to be deleterious only await investigation before being converted to useful purposes, for what is poison to the healthy may be healing to the sick.

Ornamental Plants.

In addition to the plants already mentioned as worthy of notice on account of their ornamental appearance, an enumeration may be made of others classified in the smaller natural orders, but none the less worthy of attention from those interested in gardening. In the *Dilleniaceæ* we have a large number of species of *Hibbertia* and *Candollea*, whose yellow flowers are among the first to tell us of the approach of spring. The *Pittosporeæ* provide us with elegant climbers, *Marianthus* and *Sollya*, besides a small tree, *Pittosporum phillyræoides*, the branches of which take on a "weeping" character, fitting it, along with its hardy nature, for cemetery decoration. The *Droseraceæ*, or Sun-dews, are charming plants, having their headquarters in Western Australia. They are interesting, not only for their pretty flowers and glandular leaves, glistening in the light of the sun, but also on account of their habit of capturing and digesting insects by means of those glands. Besides the *Droseras*, another genus, *Byblis*, confined to this State and Queensland, represents the order; but it is an aberrant form, showing affinities with other families. *Tetratheca* and *Platytheca* are our best known representatives of the small order *Tremandreæ*.

Digitized by Google

The *Rutaceæ*, a very large order considered in its whole extent are illustrated by numerous species of Boronia and Eriostemon. Of the former there are 37 species in the State, one of which, *B. megastigma*, is extensively cultivated elsewhere for its strong perfume. The genus *Hibiscus* in the *Malvaceæ*, and *Ruelingia*, *Thomasia*, and *Lasiopetalum* in the *Sterculiaceæ*, furnish handsome flowers. Of the *Umbelliferæ*, those known to horticulturists are the *Xanthosia*, *Actinotus*, and *Didiscus*; and more showy flowers could scarcely be found than *Loudonia* and the native *Lobelias*. In the *Loranthaceæ*, or Mistletoe order, the remarkable endemic plant *Nuytsia floribunda*, the Christmas tree, is conspicuous from November to February on account of its masses of orange flowers lighting up the landscape as with glowing fire, and, in some trees, exceeding the foliage in extent and bulk. In other orders we have also ornamental plants in *Cryptandra*, *Jasminum*, *Solanum*, *Hemiandra*, *Pimelea*, *Chloanthes*, and other *Verbenaceæ*, *Ricinocarpus* in the *Euphorbiaceæ*, *Gahnia* among the *Cyperaceæ*, and some of the grasses. Growing in the swamps, besides Droseras, Boronias, and Stylidiums, are to be seen attractive flowers of the genera *Limnanthemum* or *Villarsia*, *Utricularia* and *Polypompholyx*, *Cephalotus*, the Pitcher-plant, *Pritzelia*, and a number of others remarkable for their minute size, though not always for gay flowers.

The people of Western Australia show a general admiration of the wild flowers of the State, which is only natural and very commendable, and it is to be hoped that before the dominating influence of fashion, derived from the Mother Country in horticultural as in other matters, exercises full sway, they will have established the culture of the native plants in public and private gardens in proportion to their merits. It should be remembered that while many shrubs exhibit great beauty in their natural state, their appearance is capable of improvement, from an æsthetic point of view, under cultivation in gardens, where they may be protected and receive skilled treatment; and also that when grown in pots they do not necessarily reach their full size, so that for this reason they become more suitable for indoor decoration.

In some of the other states, as also in America, large reserves of land in its primitive state have been set apart for the preservation of the flora and fauna from extinction, and for the recreation of the people; but in none of those cases has there been so great a necessity for the reservation as obtains in Western Australia, where living plants of primitive type illustrate early stages in the evolution of vegetation in past geological ages, that in other countries can at best only be gleaned from the study of fragmentary remains found as fossils in sedimentary rocks. The scientific interest of such plants as *Byblis*, *Casuarina*, *Cephalotus*, *Nuytsia*, *Polypompholyx*, *Podocarpus*, and *Phylloglossum*, cannot be surpassed, and the recent visit to the State of one of the leading European botanists, Professor Karl Goebel, of Munich, will serve to draw the attention of students to the problems and methods of study that mark the present line of advance of modern botany.

Digitized by Google

*LIST OF *EXTRA-TROPIC WEST AUSTRALIAN PLANTS*
(VASCULARES).

By the late Baron Ferdinand von Mueller, K.C.M.G., M.D., L.L.D., Ph.D., F.R.S., &c.

Revised and augmented by A. MORRISON, Esq., Government Botanist.

DICOTYLEDONEAE.—Ray.

Choripetaleae Hypogynae.—F. v. M.

DILLENIACEAE.—SALISBURY.

HIBBERTIA, Andrews

H. verrucosa; F. v. M.
H. spicata; F. v. M.
H. polystachya; Bentham
H. rhadinopoda; F. v. M.
H. furfuracea; Bentham
H. hypericoides; F. v. M.
H. microphylla; Steudel
H. recurvifolia; Bentham
H. lineata; Steudel
H. acerosa; Bentham
H. aurea; Steudel
H. crassifolia; Bentham
H. stricta; Brown
H. gracilipes; Bentham
H. mucronata; F. v. M.
H. ochrolasia; Bentham
H. inclusa; Bentham
H. rostellata; Turczaninow
H. glomerata; Bentham
H. argentea; Steudel
H. pilosa; Steudel
H. montana; Steudel
H. grossularifolia; Salisbury
H. Cunninghamii; Aiton
H. perfoliata; Huegel
H. bracteosa; Turczaninow
H. Milnei; Bentham
H. lasiopus; Bentham
H. potentilliflora; F. v. M.
H. pungens; Bentham
H. nutans; Bentham
H. leptopus; Bentham
H. stellaris; Endlicher
H. glomerosa; F. v. M.
H. obcuneata; Salisbury
H. teretifolia; F. v. M.
H. desmophylla; F. v. M.
H. helianthemoides; F. v. M.
H. depressa; Steudel
H. Huegelii; F. v. M.
H. polygonoides; F. v. M.
H. vaginata; F. v. M.
H. subexcisa; Steudel
H. squamosa; Turczaninow
H. uncinata; F. v. M.
H. Huttii; F. v. M.

RANUNCULACEAE.—A. L. DE JUSSIEU.

CLEMATIS; Linne

C. pubescens; Huegel
C. microphylla; De Candolle

RANUNCULUS; Tournefort

R. parviflorus; Linne
R. hirtus; Banks & Solander
R. lappaceus; Smith

LAURACEAE.—VENTENAT.

CASSYTHA; Osbeck

C. nodiflora; Meissner
C. glabella; Brown
C. flava; Nees
C. pubescens; Brown
C. melantha; Brown
C. micrantha; Meissner
C. racemosa; Nees
C. pomiformis; Nees

MENISPERMEAE.—A. L. DE JUSSIEU.

TINOSPORA; Miers

T. Walcottii; F. v. M.

CAPPARIDEAE.—VENTENAT.

CLEOME; Linne

C. tetrandra; Banks
C. viscosa; Linne

EMBLINGIA; F. v. M.

E. calceoliflora; F. v. M.

CAPPARIS; Tournefort

C. lasiantha; Brown
C. spinosa; Linne
C. umbonata; Lindley

CRUCIFERAE.—A. L. DE JUSSIEU.

CARDAMINE; Tournefort

C. hirsuta; Linne

SISYMBRIUM; Tournefort

S. trisectum; F. v. M.
S. Richardsii; F. v. M.
S. cardamindides; F. v. M.

ERYSIMUM; Linne

E. brevipues; F. v. M.

ALYSSUM; Tournefort

A. minimum; Pallas

STENOPETALUM; Brown

S. velutinum; F. v. M.
S. lineare, Brown
S. sphaerocarpum; F. v. M.
S. nutans; F. v. M.
S. robustum; Endlicher
S. pedicellare; F. v. M.
S. croceum; Bunge

MENKEA; Lehmann

M. Australis; Lehmann
M. Coolgardiensis; S. Moore
M. draboides; J. Hooker
M. sphaerocarpa; F. v. M.

CAPSELLA; Medicus

C. elliptica; C. A. Meyer
C. pilosula; F. v. M.
C. Drummondii; F. v. M.

*A list of extra-tropical West Australian plants was prepared by the late Baron Von Mueller for the West Australian *Year Book*, issued in 1896, and contained all the species known up to the year 1895. Since that date, however, a large number of plants has been added to the flora of the State, and it is thought desirable to include in the present issue of the *Year Book* a new list containing all the species recorded up to the present date. Keeping in view the compilation of a complete catalogue of the indigenous plants of the whole area of Western Australia, those recently recorded from within the tropical line have not been excluded from the present list, in spite of the wording of its title; and it is hoped that the next edition will form a complete census of the native plants of the State, including also many of those tropical species which have hitherto been recorded as from *Northern* Australia. In compiling the present list, acknowledgment must be made of the assistance rendered by Mr. J. G. Luehmann, Government Botanist at Melbourne, who has supplied some alterations determined on by the late Baron before his death. These will be found under the genera *Aotus* and *Dillwynia*, *Waitzia*, *Perotis*, and *Anthistiria*, and may be taken as indicative of the Baron's latest views thereon.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

LEPIDIUM; Tournefort
L. Merralli; F. v. M.
L. stroniylophyllum; F. v. M.
L. linifolium; Bentham
L. leptopetalum; F. v. M.
L. rotundum; De Candolle
L. phlebopetalum; F. v. M.
L. papillosum; F. v. M.
L. foliosum; Desvaux
L. ruderale; Linne

CAKILE; Tournefort
C. maritima; Scopoli

VIOLACEAE.—DE CANDOLLE

HYBANTHUS; Jacquin
H. floribundus; F. v. M.
H. debilissimus; F. v. M.
H. calycinus; F. v. M.
H. enneaspermus; F. v. M.

PITTOSPOREAE.—BROWN.

PITTOSPORUM; Banks.
P. phillyroides; De Candolle

BURSARIA; Cavanilles
B. spinosa; Cavanilles

MARIANTHUS; Huegel
M. rhytidosporeus; F. v. M.
M. villosus; Bentham
M. parviflorus; F. v. M.
M. Drummondianus; Bentham
M. coeruleo-punctatus; Klotzsch
M. candidus; Huegel
M. erubescens; Putterlick
M. ringens; F. v. M.
M. lineatus; F. v. M.
M. pictus; Lindley

BILLARDIERA; Smith
B. coriacea; Bentham
B. elegans; F. v. M.
B. variifolia; De Candolle
B. Lehmanniana; F. v. M.
B. floribunda; F. v. M.

SOLLYA; Lindley
S. heterophylla; Lindley
S. parviflora; Turczaninow

CHEIRANTHERA; Cunningham.
C. filifolia; Turczaninow
C. parviflora; Bentham

DROSERACEAE.—SALISBURY

DROSERA; Linne
D. Indica; Linne
D. glanduligera; Lehmann
D. platystigma; Lehmann
D. pulchella; Lehmann
D. leucoblasta; Bentham
D. nitidula; Planchon
D. paleacea; Brown
D. parvula; Planchon
D. Drummondii; Lehmann
D. scorpioides; Planchon
D. zonaria; Planchon
D. bulbosa; Hooker
D. rosulata; Lehmann
D. macrophylla; Lindley
D. squamosa; Bentham
D. erythrorrhiza; Lindley
D. stolonifera; Endlicher
D. humilis; Planchon
D. ramellosa; Lehmann
D. platypoda; Turczaninow
D. peltata; Smith
D. Neesii; Lehmann
D. gigantea; Lindley
D. myriantha; Planchon
D. pallida; Lindley
D. penicillaris; Bentham
D. filicaulis; Endlicher
D. Huegelii; Endlicher
D. macrantha; Endlicher
D. Menziesii; Brown
D. calycina; Planchon
D. heterophylla; Lindley

BYBLIS; Salisbury
B. liniflora; Salisbury
B. gigantea; Lindley

ELATINEAE.—CAMBESSEDES.

ELATINE; Linne
E. Americana; Arnott

HYPERICINAE.—J. DE ST. HILAIRE.

HYPERICUM; Tournefort
H. Japonicum; Thunberg

POLYGALEAE.—A. L. DE JUSSIEU.

POLYGALA; Tournefort
P. Tepperi; F. v. M.

COMESPERMA; Labillardiere
C. scoparium; Steetz
C. spinosum; F. v. M.
C. volubile; Labillardiere
C. ciliatum; Steetz
C. integerrimum; Endlicher
C. Drummondii; Steetz
C. viscidulum; F. v. M.
C. acerosum; Steetz
C. confertum; Labillardiere
C. flavum; De Candolle
C. calymega; Labillardiere
C. rhadinocarpum; F. v. M.
C. lanceolatum; Brown
C. nudiusculum; De Candolle
C. virgatum; Labiardiere
C. polygaloides; F. v. M.

TREMANDREAE.—BROWN.

PLATYTHECA; Steetz
P. galioides; Steetz

TETRATHECA; Smith
T. Harperi; F. v. M.
T. efoliata; F. v. M.
T. aphylla; F. v. M.
T. affinis; Endlicher
T. nuda; Lindley
T. virgata; Steetz
T. confertifolia; Steetz
T. setigera; Endlicher
T. hirsuta; Lindley
T. pilifera; Lindley
T. filiformis; Bentham

TREMANDRA; Brown
T. stelligera; Brown
T. diffusa; Brown

MELIACEAE—VENTENAT.

OWENIA; F. v. M.
O. reticulata; F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued*.

RUTACEAE—A. L. DE JESSIEU.

BORONIA; Smith

B. alata; Smith
B. ternata; Endlicher
B. Adamsiana; F. v. M.
B. ericifolia; Bentham
B. inconspicua; Bentham
B. megastigma; Nees
B. heterophylla; F. v. M.
B. elatior; Bartling
B. tetrandra; Labillardiere
B. crassifolia; Bartling
B. albiflora; Brown
B. lanuginosa; Endlicher
B. pulchella; Turczaninow
B. gracilipes; F. v. M.
B. spinescens; Bentham
B. baeckeacea; F. v. M.
B. coerulescens; F. v. M.
B. defoliata; F. v. M.
B. Busselliana; F. v. M.
B. subcoerulea; F. v. M.
B. penicillata; Bentham
B. crassipes; Bartling
B. subsessilis; Bentham
B. capitata; Bentham
B. nematophylla, F. v. M.
B. haloragoides; F. v. M.
B. crenulata; Smith
B. viminea; Lindley
B. clavellifolia; F. v. M.
B. scabra; Lindley
B. thymifolia; Turczaninow
B. ovata; Lindley
B. denticulata, Smith
B. Machardiana; F. v. M.
B. spathulata; Lindley
B. juncea; Bartling
B. cymosa; Endlicher

ERIOSTEMON; Smith

E. nodiflorus; Lindley
E. spicatus; A. Richard
E. tuberculosus; F. v. M.
E. Benthami; F. v. M.
E. Maxwelli; F. v. M.
E. canaliculatus; F. v. M. & Tate
E. filifolius; F. v. M.
E. anceps; Sprengel
E. bilobus; F. v. M.
E. capitatus; F. v. M.
E. Geleznowii; F. v. M.
E. Hookeri; F. v. M.
E. pallidus; F. v. M.
E. Drummondii; F. v. M.
E. grandiflorus; F. v. M.
E. Turczaninowii; F. v. M.
E. Brucei; F. v. M.
E. linearis; Cunningham
E. difformis; Cunningham

PHILOTHECA; Rudge

P. ericoides; F. v. M
P. Hasselli; F. v. M.

NEMATOLEPIS; Turczaninow.

N. phebalioides; Turczaninow
N. Euphemiae; F. v. M.

CHORILAENA; Endlicher.

C. quercifolia; Endlicher
C. Hasselli; F. v. M.
C. hirsuta; Bentham

DIPLOLAENA; Brown.

D. Dampieri; Desfontaines

GELIERA; Schott.

G. parviflora; Lindley

ZYGOPHYLLEAE—BROWN.

NITRARIA; Linne

N. Schoberi; Linne

ZYGOPHYLLUM; Linne

Z. apiculatum; F. v. M.
Z. glaucescens; F. v. M.
Z. crenatum; F. v. M.
Z. iodocarpum; F. v. M.
Z. ammophilum; F. v. M.
Z. Billardieri; De Candolle
Z. fruticulosum; De Candolle

TRIBULUS; L'Obel

T. terrestris; L'Obel
T. hystrix; Brown
T. macrocarpus; F. v. M.
T. Forrestii; F. v. M.
T. platypterus; Bentham
T. hirsutus; Bentham
T. Solandri; F. v. M.
T. astrocarpus; F. v. M.

LINEAE.—DE CANDOLLE.

LINUM; Tournefort

L. marginale; Cunningham

GERANIACEAE.—A. L. DE JUSSIEU.

GERANIUM; Tournefort

G. pilosum; Solander

ERODIUM; L'Heritier

E. cygnorum; Nees

PELARGONIUM; L'Heritier

P. Australe; Willdenow
P. Rodneyanum; Mitchell

OXALIS; Linne

O. corniculata; Linne

MALVACEAE.—ADANSON.

LAVATERA; Tournefort

L. plebeja; Sims

MALVASTRUM; Asa Gray

M. spicatum; A. Gray

PLAGIANTHUS; R. & G. Forster

P. spicatus; Bentham
P. glomeratus; Bentham
P. diffusus; Bentham
P. repens; S. Moore
P. Helmsii; F. v. M.
P. microphyllus; F. v. M.
P. Berthae; F. v. M.

SIDA; Linne

S. corrugata; Lindley
S. intricata; F. v. M.
S. virgata; Hooker
S. cryphiopetala; F. v. M.
S. petrophila; F. v. M.
S. Kingii; F. v. M.
S. calyxhymenia; A. Gay
S. physocalyx; F. v. M.
S. podopetala; F. v. M.
S. inclusa; Bentham
S. cardiophylla; F. v. M.
S. Hookeriana; Miquel
S. lepida; F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

ABUTILON: Tournefort
A. cryptopetalum; F. v. M.
A. geranioides; Bentham
A. dioecarpum; F. v. M.
A. longilobum; F. v. M.
A. oxycarpum; F. v. M.
A. Fraseri; Hooker
A. halophilum; F. v. M.

HIBISCUS: Linne
H. Trionum; Linne
H. Drummondii; Turczaninow
H. microlaenus; F. v. M.
H. Pinonianus; Gaudichaud
H. Haynaldi; F. v. M.
H. zonatus; F. v. M.
H. Coatesii; F. v. M.
H. pandurifformis; N. Burmann
H. Krichauffii; F. v. M.
H. Farragei; F. v. M.
H. Sturtii; Hooker
H. Huegelii; Endlicher
H. Wrayae; Lindley
H. cuneiformis; De Candolle
H. hakeaefolius; Giordano

GOSSYPIUM; Linne
G. Robinsoni; F. v. M.
G. Australe; F. v. M.

ADANSONIA; Linne
A. Gregorii; F. v. M.

STERCULIACEAE.—VENTENAT.

BRACHYCHITON; Schott & Endlicher
B. platanoides; Brown
B. diversifolius; Brown
B. Gregorii; F. v. M.

HERMANNIA; Tournefort
H. Gilesii; F. v. M.

WALTHERIA; Linne
W. Indica; Linne

COMMERCONIA; R. and G. Forster
C. (Ruelingia) coacta; S. Moore
C. Preissii; Steudel
C. cinerea; Steudel
C. cygnorum; Steudel
C. platycalyx; F. v. M.
C. parviflora; F. v. M.
C. Kempeana; F. v. M.
C. cuneata; F. v. M.
C. rotundifolia; F. v. M.
C. densiflora; F. v. M.
C. Gaudichaudi; J. Gay
C. crispa; Turczaninow
C. melanopetala; F. v. M.
C. pulchella; Turczaninow
C. microphylla; Bentham
C. craurophylla; F. v. M.

HANNAFORDIA; F. v. M.
H. quadrivalvis; F. v. M.
H. Bissillii; F. v. M.

SERINGEA; Sprengel
S. microphylla, F. v. M.
S. integrifolia; F. v. M.

THOMASIA; J. Gay
T. macrocarpa; Huegel
T. rugosa; Turczaninow
T. montana; Steudel
T. tenuivestita; F. v. M.
T. solanacea; J. Gay
T. brachystachys; Turczaninow
T. discolor; Steudel
T. quercifolia; J. Gay
T. foliosa; J. Gay
T. triloba; Turczaninow
T. triphylla; J. Gay
T. purpurea; J. Gay
T. macrocalyx; Steudel
T. pauciflora; Lindley
T. rhynchocarpa; Turczaninow
T. grandiflora; Lindley
T. cognata; Steudel
T. rufingioides; Steudel
T. angustifolia; Steudel
T. petalocalyx; F. v. M.
T. Sarotes; Turczaninow

GUICHENOTIA; J. Gay
G. ledifolia; J. Gay
G. macrantha; Turczaninow
G. semihastata; Bentham
G. Sarotes; Bentham
G. micrantha; Bentham

LASIOPETALUM; Smith
L. laxiflorum; F. v. M.
L. pygmaeum; Bentham
L. stelligerum; Bentham
L. glutinosum; F. v. M.
L. discolor; Hooker
L. indutum; Steudel
L. Maxwelli; F. v. M.
L. Ogilvieanum; F. v. M.
L. parviflorum; F. v. M.
L. Fitzgibboni, F. v. M.
L. oppositifolium; F. v. M.
L. acutiflorum; Turczaninow
L. Oldfieldii; F. v. M.
L. quinquenervium; Turczaninow
L. Drummondii; Bentham
L. rosmarinifolium; Bentham
L. cordifolium; Endlicher
L. floribundum; Bentham
L. molle; Bentham
L. membranaceum; Bentham
L. bracteatum; Bentham

LYSIOSEPALUM; F. v. M.
L. Barryanum; F. v. M.
L. rugosum; Bentham

TILLIACEAE.—A. L. DE JUSSIEU

CORCHORUS; Tournefort.
C. vermicularis; F. v. M.
C. sidoides; F. v. M.

TRIUMFETTA; Plumier
T. chaetocarpa; F. v. M.
T. Johnstonii; F. v. M.

EUPHORBIACEAE.—A. L DE JUSSIEU.

CALYCOPEPLUS; Planchon
C. ephedroides; Planchon
C. marginatus; Bentham
C. Helmsii; F. v. M. & Tate

EUPHORBIA; Linne
E. Mitchelliana; Boissier
E. erythrantha; F. v. M.
E. Drummondii; Boissier
E. alsinifiora; Baillon
E. myrtoides; Boissier
E. Careyi; F. v. M.
E. eremophila; Cunningham

MONOTAXIS; Brongniart
M. occidentalis; Endlicher
M. lurida; Bentham
M. megacarpa; F. v. M.
M. gracilis; Baillon
M. grandiflora; Endlicher
M. luteiflora; F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

PORANTHERA; Rudge

P. ericoides; Klotzsch
P. Huegelii; Klotzsch
P. microphylla; Brongniart

PSEUDANTHUS; Sieber

P. occidentalis; F. v. M.
P. nematophorus; F. v. M.
P. polyandrus; F. v. M.
P. brachyphyllus; F. v. M.
P. vermicularis; F. v. M.

BEYERIA; Miquel

B. viscosa; Miquel
B. latifolia; Baillon
B. cygnorum; Baillon
B. cinerea; Baillon
B. cyanescens; Bentham
B. lepidopetala; F. v. M.
B. similis; Baillon
B. brevifolia, Baillon
B. Drummondii; J. Mueller

RICINOCARPUS; Desfontaines

R. tuberculatus; J. Muller
R. cyanescens; J. Muller
R. pilocladus; Bentham
R. glaucus; Endlicher
R. trichoporus; J. Muller
R. muricatus; J. Muller
R. velutinus; F. v. M.

BERTYA; Planchon

B quadrisepala; F. v. M.
B. dimerostigma; F. v. M.

AMPERREA; Adr. de Jussieu

A. protensa; Nees
A. volubilis; F. v. M.
A. micrantha; Bentham
A. conferta; Bentham
A. ericoides. Adr. de Jussieu

ANDRACHNE; Linne

A. Decaisnei; Bentham

PETALOSTIGMA; F. v. M.

P. quadriloculare; F. v. M.

PHYLLANTHUS; Linne

P. crassifolius; J. Mueller
P. calycinus; Labillardiere
P. Fuernrohrii; F. v. M.
P. lacunarius; F. v. M.
P. scaber; Klotzsch

SECURINEGA; A. L. de Jussieu

S. Abyssinica; A. Richard

ADRIANA; Gaudichaud

A. tomentosa; Gaudichaud
A. quadripartita; Gaudichaud

URTICACEAE.—VENTENAT.

FICUS; Tournefort

F. platypoda; Cunningham

PARIETARIA; Tournefort

P. debilis; G. Forster

CASUARINEAE.—MIRBEL.

CASUARINA; Rumhplus

C. quadrivalvis; Labillardiere
C. trichodon; Miquel
C. glauca; Sieber
C. Huegeliana; Miquel
C. distyla; Ventenat
C. Fraseriana; Miquel
C. humilis; Otto & Dietrich
C. decussata; Bentham
C. Decaisneana; F. v. M.
C. Drummondiana; Miquel
C. microstachya; Miquel
C. acutivalvis; F. v. M.
C. bicuspidata; Bentham
C. thuyoides; Miquel
C. corniculata; F. v. M.
C. acuaria; F. v. M.

SAPINDACEAE.—A. L. DE JUSSIEU

ATALAYA; Blume

A. hemiglauca; F. v. M.

HETERODENDRON; Desfontaines

H. oleaefolium; Desfontaines

DIPLOPELTIS; Endlicher

D. Huegelii; Endlicher
D. Stuartii; F. v. M.

DODONAEA; Linne

D. lanceolata; F. v. M.
D. petiolaris; F. v. M.
D. viscosa; Linne
D. filifolia; Hooker
D. lobulata; F. v. M.
D. ptarmicifolia; Turczaninow
D. platyptera; F. v. M.
D. pachyneura; F. v. M.
D. pinifolia; Miquel
D. ceratocarpa; Endlicher
D. divaricata; Bentham
D. aptera; Miquel
D. bursariifolia; Behr & F. v. M.
D. trifida; F. v. M.
D. humifusa; Miquel
D. hexandra; F. v. M.
D. ericoides; Miquel
D. microzyga; F. v. M.
D. larraeoides; Turczaninow
D. inaequifolia; Turczaninow
D. adenophora; Miquel
D. stenozyga; F. v. M.
D. concinna; Bentham

STACKHOUSIEAE.—BROWN.

STACKHOUSIA; Smith

S. pubescens; A. Richard
S. Huegelii; Endlicher
S. flava; Hooker
S. muricata; Lindley
S. viminea; Smith
S. elata; F. v. M
S. scoparia; Bentham
S. megaloptera; F. v. M.
S. Brunonis; Bentham

MACGREGORIA; F. v. M.

M. racemigera; F. v. M.

FRANKENIACEAE.—A. DE ST. HILAIRE

FRANKENIA; Linne

F. laevis; Linne
F. bracteata; Turczaninow
F. glomerata; Turczaninow
F. parvula; Turczaninow
F. Drummondii; Bentham
F. tetrapetala; Labillardiere
F. punctata; Turczaninow

PLUMBAGINEAE.—A. L. DE JUSSIEU.

STATICE; Linne

S. Macphersoni; F. v. M.
S. salicorniacea; F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

PORTULACEAE.—A. L. DE JUSSIEU.

PORTULACA; Tournefort

P. oleracea; Linne
P. cyclophylla; F. v. M.

CLAYTONIA; Gronovius

C. ptychosperma; F. v. M.
C. strophiolata, F. v. M.
C. Lehmanni; F. v. M.
C. Balonnensis; F. v. M.
C. polyandra; F. v. M.
C. linifiora, F. v. M.
C. polypetala; F. v. M.
C. volubilis; F. v. M.
C. calyptrata; F. v. M.
C. pumila; F. v. M.
C. composita; F. v. M.
C. corrigioloides; F. v. M.
C. brevipedata; F. v. M.
C. granulifera; F. v. M.
C. pygmaea; F. v. M.
C. Australasica; J. Hooker

CARYOPHYLLEAE.—LINNE.

STELLARIA; Linne.

S. multiflora; Hooker

SAGINA; Linne

S. apetala; Arduino

SAPONARIA; Linne

S. tubulosa; F. v. M.

SPERGULARIA; Persoon

S. rubra; Cambessedes

DRYMARIA; Willdenow

D. filiformis; Bentham

POLYCARPON; Loefling

P. tetraphyllum; Loefling

POLYCARPAEA; Lamarck

P. longiflora; F. v. M.
P. violacea; Bentham
P. Indica; Lamarck
P. breviflora; F. v. M.

AMARANTACEAE.—A. L. DE JUSSIEU.

GOMPHRENA; Linne

G. canescens; Brown
G. flaccida; Brown
G. affinis; F. v. M.
G. platandra; F. v. M.
G. Maitlandi; F. v. M.
G. conferta; Bentham

ALTERNANTHERA; Forskael

A. triandra; Lamarck

ACHYRANTHES; Linne

A. aspera; Linne

DIPTERANTHEMUM; F. v. M.

D. Cresslandi; F. v. M.

PTILOTUS; Brown

P. grandiflorus; F. v. M.
P. Murrayi; F. v. M.
P. gomphrenoides; F. v. M.
P. latifolius; Brown
P. macrotrichus; F. v. M.
P. humilis; F. v. M.
P. obovatus; F. v. M.
P. rotundifolius; F. v. M.
P. alopecuroideus; F. v. M.
P. hemisteirus; F. v. M.
P. (Trichinium) eremita; S. Moore
P. parvifolius; F. v. M.
P. Polakii; F. v. M.
P. exaltatus; Nees
P. Manglesii; F. v. M.
P. gomphrenoides; Moquin
P. esquamatus; F. v. M.
P. declinatus; Nees
P. divaricatus; F. v. M.
P. helipteroides; F. v. M.
P. Stirlingi; F. v. M.
P. laxus; F. v. M.
P. axillaris; F. v. M.
P. striatus; F. v. M.
P. sericostachyus; F. v. M.
P. roseus; F. v. M.
P. gracilis; Poiret
P. Drummondii; F. v. M.
P. Carlsoni; F. v. M.
P. Sewelliae; F. v. M.
P. spathulatus; Poiret
P. pyramidatus; F. v. M.
P. holosericeus; F. v. M.
P. arthrolasius; F. v. M.
P. Roei; F. v. M.
P. caespitulosus; F. v. M.
P. helichrysoides; F. v. M.
P. psilotricholdes; F. v. M.

EUXOLUS; Rafinesque

E. Mitchelli; F. v. M.
E. viridis; Moquin

AMARANTUS; Dodoens

A. pallidiflorus; F. v. M.

POLYCNEMON; Linne

P. pentandrum; F. v. M.
P. diandrum; F. v. M.

SALSOLACEAE.—LINNE.

ATRIPLEX; Tournefort

A. crystallinum; J. Hooker
A. semibaccatum; Brown
A. prostratum; Brown
A. stipitatum; Bentham
A. paludosum; Brown
A. Moquinianum; Webb
A. Drummondi; Moquin
A. cinereum; Poiret
A. rhagodioides, F. v. M.
A. mummularium; Lindley
A. hymenothecum; Moquin
A. vesicarium; Heward
A. halimoides; Lindley
A. spongiosum; F. v. M.

RHAGODIA; Brown

R. Billardieri; Brown
R. parabolica; Brown
R. dioica; Nees
R. Gaudichaudiana; Moquin
R. crassifolia; Brown
R. Preissii; Moquin
R. obovata; Moquin
R. spinescens; Brown
R. coralliocarpa; S. Moore
R. nutans; Brown

CHENOPODIUM; Tournefort

C. nitrariaceum; F. v. M.
C. cristatum; F. v. M.
C. carinatum; Brown
C. rhadinostachyum; F. v. M.
C. simulans; F. v. M. & Tate

DYSPHANIA; Brown

D. plantaginella; F. v. M.
D. litoralis; Brown

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

KOCHIA; Roth

K. lobiflora; F. v. M.
K. lanosa; Lindley
K. prosthecochaeta; F. v. M.
K. melanocoma; F. v. M.
K. triptera; Bentham
K. oppositifolia; F. v. M.
K. brevifolia; Brown
K. spongiocarpa; F. v. M.
K. aphylla; Brown
K. villosa; Lindley
K. planifolia; F. v. M.
K. sedifolia; F. v. M.
K. glomerifolia; F. v. M. & Tate

DIDYMANTHUS; Endlicher

D. Roei; Endlicher

BASSIA; Allioni

B. carnosa; F. v. M.
B. tricornis; F. v. M
B. tridens; F. v. M.
B. eurotioides; F. v. M.
B. astrocarpa; F. v. M.
B. sclerolaenoides; F. v. M.
B. uniflora; F. v. M.
B. diacantha; F. v. M.
B. lanicuspis; F. v. M.
B. bicornis; F. v. M.
B. paradoxa; F. v. M.
B. Forrestiana; F. v. M.
B. Drummondii; F. v. M.
B. divaricata; F. v. M
B. echinopsila; F. v. M.
B. micrantha; F. v. M.

THRELKELDIA; Brown

T. diffusa; Brown

ENCHYLAENA; Brown

E. tomentosa; Brown

SALICORNIA; Tournefort

S. robusta; F. v. M.
S. arbuscula; Brown
S. leiostachya; Bentham
S. bidens; Bentham
S. Australis; Solander

SUAEDA; Forskael

S. maritima; Dumortier

SALSOLA; Linne

S. Kali; Linne

FICOIDEAE.—A. L. DE JUSSIEU.

MESEMBRIANTHEMUM; Breyne

M. aequilaterale; Haworth
M. Australe; Solander

TETRAGONIA; Linne

T. expansa; Murray
T. diptera; F. v. M.
T. implexicoma; Hooker

AIZOON; Linne

A. quadrifidum; F. v. M.
A. zygophylloides; F. v. M.

GUNNIA; F. v. M.

G. septifraga; F. v. M.
G. Drummondii; Bentham

ZALEYA; N. L. Burmann

Z. decandra; N. L. Burmann

TRIANTHEMA; Sauvage

T. crystallina; Vahl
T. glaucifolia; F. v. M.
T. pilosa; F. v. M.
T. glossostigma; F. v. M

MACARTHURIA; Huegel

M. apetala; Harvey
M. Australis; Huegel

MOLLUGO; Linne

M. hirta; Thunberg
M. Spergula; Linne
M. trigastrotheca; F. v. M.
M. Cerviana; Seringe

POLYGONACEAE.—A. L. DE JUSSIEU.

EMEX; Necker

E. Australis; Steinheil

RUMEX; Linne

R. crystallinus; Lange

POLYGONUM; l'Obel

P. prostratum; Brown
P. minus; Hudson

MUEHLENBECKIA; Meissner

M. adpressa; Meissner
M. polybotrya; Meissner
M. stenophylla; F. v. M.
M. Cunninghamii; F. v. M.

PHYTOLACCEAE.—BROWN.

DIDYMOTHECA; J. Hooker

D. thesioides; J. Hooker
D. pleiococca; F. v. M.

GYROSTEMON; Desfontaines

G. brachystigma; F. v. M.
G. ramulosus; Desfontaines

CONDONOCARPUS; Cunningham

C. cotinifolius; F. v. M.

TERSONIA; Moquin

T. brevipes; Moquin
T. subvolubilis; Bentham

CYPSELOCARPUS; F. v. M.

C. haloragoides; F. v. M.

NYCTAGINEAE.—A. L. DE JUSSIEU.

BOERHAAVIA; Vaillant

B. diffusa; Linne
B. plantaginea; Cavanilles

CHORIPETALEAE PERIGYNAE.—F. v. M.

THYMELEAE.—A. L. DE JUSSIEU.

PIMELEA; Banks & Solander.

P. spectabilis; Lindley
P. Lehmanniana; Meissner
P. hispida; Brown
P. rosea; Brown
P. ferruginea; Labillardiere
P. brachyphylla; Bentham
P. sylvestris; Brown
P. brevifolia; Brown
P. Maxwelli; F. v. M.
P. angustifolia; Brown
P. nervosa; Meissner
P. sulphurea; Meissner
P. floribunda; Meissner
P. suaveolens; Meissner
P. physodes; Hooker
P. imbricata; Brown

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

P. villifera; Meissner
P. spiculigera; F. v. M.
P. trichostachya; Lindley
P. argentea; Brown
P. clavata; Labillardiere
P. microcephala; Brown
P. thesioides; S. Moore
P. serpyllifolia; Brown
P. flava; Brown
P. ammocharis; F. v. M.
P. Eyrei; F. v. M.
P. longiflora; Brown
P. Preissii; Meissner

LEGUMINOSAE.—HALLER.

JANSONIA; Kippist

J. formosa; Kippist

BRACHYSEMA; Brown

B. praemorsum; Meissner
B. lanceolatum; Meissner
B. latifolium; Brown
B. undulatum; Ker
B. subcordatum; Bentham
B. bracteolosum; F. v. M.
B. aphyllum; Hooker
B. macrocarpum; Bentham
B. tomentosum; Bentham
B. Chambersii; F. v. M
B. daviesioides; Bentham

OXYLOBIUM; Andrews

O. Callistachys; Bentham
O. lineare; Bentham
O. carinatum; Bentham
O. spathulatum; Bentham
O. obtusifolium; Sweet
O. microphyllum; Bentham
O. tricuspidatum; Meissner
O. spectabile; Endlicher
O. atropurpureum; Turczaninow
O. retusum; Brown
O. graniticum; S. Moore
O. virgatum; Bentham
O. reticulatum; Meissner
O. capitatum; Bentham
O. cuneatum; Bentham
O. acutum; Bentham
O. parviflorum; Bentham
O. heterophyllum; Bentham

CHORIZEMA; Labillardiere

C. Dicksonii; Graham
C. nervosum; Th. Moore
C. varium; Bentham
C. cordatum; Lindley
C. ilicifolium; Labillardiere
C. rhombeum; Brown
C. diversifolium; A. de Candolle
C. angustifolium; Bentham
C. reticulatum; Meissner
C. trigonum; Turczaninow
C. humile; Turczaninow
C. cytisoides; Turczaninow
C. Henchmanni; Brown
C. ericifolium; Meissner

GASTROLOBIUM; Brown

G. pyramidale; Th. Moore
G. Lehmanni; Meissner
G. pulchellum; Turczaninow
G. stipulare; Meissner
G. Brownii; Meissner
G. reticulatum; Bentham
G. truncatum; Bentham
G. spathulatum; Bentham
G. plicatum; Turczaninow
G. tricuspidatum; Meissner
G. obovatum; Bentham
G. epacridioides; Meissner
G. trilobum; Bentham
G. ilicifolium; Meissner
G. villosum; Bentham
G. polystachyum; Meissner
G. ovalifolium; Henfrey
G. grandiflorum; F. v. M.
G. pycnostachyum; Bentham
G. spinosum; Bentham
G. rotundifolium; Meissner
G. microcarpum; Meissner
G. oxylobioides; Bentham
G. calycinum; Bentham
G. Callistachys; Meissner
G. stenophyllum; Turczaninow
G. crassifolium; Bentham
G. parvifolium; Bentham
G. hamulosum; Meissner
G. velutinum; Lindley & Paxton
G. bidens; Meissner
G. bilobum; Brown
G. scorsifolium; F. v. M.

ISOTROPIS; Bentham

I. striata; Bentham
I. Drummondii; Meissner
I. juncea; Turczaninow
I. canescens; F. v. M.
I. atropurpurea; F. v. M.
I. Forrestii; F. v. M.

MIRBELIA; Smith

M. dilatata; Brown
M. racemosa; Turczaninow
M. subcordata; Turczaninow
M. ovata; Meissner
M. floribunda; Bentham
M. microphylloides; S. Moore
M. microphylla; Bentham
M. multicaulis; Bentham
M. aphylla; F. v M.

GOMPHOLOBIUM; Smith

G. amplexicaule; Meissner
G. polymorphum; Brown
G. obcordatum; Turczaninow
G. marginatum; Brown
G. Eatoniae; F. v. M.
G. Baxteri; Bentham
G. aristatum; Bentham
G. burtonioides; Meissner
G. capitatum; Cunningham
G. tomentosum; Labillardiere
G. Preissii; Meissner
G. viscidulum; Meissner
G. Shuttleworthii; Meissner
G. venustum; Brown
G. Knightianum; Lindley

BURTONIA; Brown

B. villosa; Meissner
B. Hendersonii; Bentham
B gomphoboioides; F. v. M.
B. scabra; Brown
B. conferta; De Candolle
B. simplicifolia; F. v. M. & Tate

JACKSONIA; Brown

J. densiflora; Bentham
J. carduacea; Meissner
J. floribunda; Endlicher
J. follosa; Turczaninow
J. spinosa; Brown
J. stricta; Meissner
J. hakeoides; Meissner

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

J. furcellata; De Candolle
J. horrida; De Candolle
J. sericea; Bentham
J. Sternbergiana; Huegel
J. Forrestii; F. v. M.
J. compressa; Turczaninow
J. cupulifera; Meissner
J. restioides; Meissner
J. velutina; Bentham
J. Lehmanni; Meissner
J. racemosa; Meissner
J. umbellata; Turczaninow
J. nematocladu; F. v. M.
J. rhadinocladu; F. v. M.
J. capitata; Meissner
J. alata; Bentham
J. angulata; Bentham
J. pterocladu; F. v. M.
J. macrocalyx; Meissner
J. piptomeria; Bentham

SPHAEROLOBIUM Smith

S. linophyllum; F. v. M.
S. foliosum; F. v. M.
S. gracile; Bentham
S. racemulosum; Bentham
S. alatum; Bentham
S. vimineum; Smith
S. grandiflorum; Brown
S. fovcolatum; Bentham
S. medium; Brown
S. scabriusculum; Meissner
S. macranthum; Meissner
S. daviesioides; Turczaninow

VIMINARIA; Smith

V. denudata; Smith

DAVIESIA; Smith

D. cordata; Smith
D. ovata; Bentham
D. obtusata; Turczaninow
D. oppositifolia; Endlicher
D. alternifolia; Endlicher
D. elongata; Bentham
D. pedunculata; Bentham
D. arthropoda; F. v. M.
D. mollis; Turczaninow
D. horrida; Meissner
D. obtusifolia; F. v. M.
D. obovata; Turczaninow
D. Cunninghamii; F. v. M
D. latifolia; Bentham
D. chordophylla; F. v. M.
D. monophylla; F. v. M.
D. daphnoides; Meissner
D. [illegible]; Meissner
D. rhombifolia; Meissner
D. Drummondii; Meissner
D. cordiophylla; F. v. M.
D. pachyphylla; F. v. M.
D. teretifolia; Brown
D. [illegible]; Meissner
D. [illegible]; Meissner
D. [illegible]; F. v. M.
D. [illegible]; Smith
D. [illegible]; Dudley
D. [illegible]; F. v. M.
D. [illegible]; Meissner
D. [illegible]; Meissner
D. [illegible]; Turczaninow
D. [illegible]; Bentham
D. [illegible]; Turczaninow
D. [illegible]; Bentham
D. [illegible]; Bentham
D. [illegible]; Bentham
D. [illegible]; Dudley
D. [illegible]; Meissner
D. [illegible]; Meissner

D. euphorbioides; Bentham
D. divaricata; Bentham
D. paniculata; Bentham
D. aphylla; F. v. M.
D. juncea; Smith
D. anceps; Turczaninow

AOTUS; Smith

A. Preissii; Meissner
A. phylicoides; F. v. M.
A. genistoides; Turczaninow
A. carinata; Meissner
A. passerinoides; Meissner
A. Tietkensii; F. v. M.
A. cordifolia; Bentham

PHYLLOTA; De Candolle

P. barbata; Bentham
P. gracilis; Turczaninow
P. Luehmanni; F. v. M.
P. humilis; S. Moore
P. Urodon; F. v. M.
P. lycopodioides; S. Moore

PULTENAEA; Smith

P. Skinneri; F. v. M.
P. Drummondii; Meissner
P. pinifolia; Meissner
P. conferta; Bentham
P. aciphylla; Bentham
P. ochreata; Meissner
P. aspalathoides; Meissner
P. obcordata; Bentham
P. rotundifolia; Bentham
P. calycina; Bentham
P. spinulosa; Bentham
P. strobilifera; Meissner
P. ericifolia; Bentham
P. verruculosa; Turczaninow
P. empetrifolia; Meissner
P. adunca; Turczaninow
P. neurocalyx; Turczaninow
P. vestita; Brown
P. tenuifolia; Brown

LATROBEA Meissner

L. pungens; Bentham
L. genistoides; Meissner
L. Brunonis; Meissner
L. tenella; Bentham
L. hirtella; Bentham
L. diosmifolia; Bentham

EUTAXIA Brown

E. cuneata Meissner
E. myrtifolia; Brown
E. epacridoides; Meissner
E. virgata; Bentham
E. densifolia; Turczaninow
E. dillwynioides; Meissner
E. parvifolia; Bentham
E. empetrifolia; Schlechtendal

DILLWYNIA Smith

D. gracillima; F. v. M.
D. Preissii; Bentham
D. acerosa; S. Moore
D. pungens; Mackay
D. cinerascens; Brown
D. divaricata; Bentham
D. patula; F. v. M.

EUCHILOPSIS F v. M.

E. linearis; F. v. M

BOSSIAEA; Ventenat

B. dentata; Bentham
B. Aquifolium; Bentham
B. Webbii; F. v. M.
B. strigillosa; Bentham

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

B. ornata; F. v. M.
B. eriocarpa; Bentham
B. divaricata; Turczaninow
B. calycina; Bentham
B. biloba; Bentham
B. Preissii; Meissner
B. concinna; Bentham
B. linophylla; Brown
B. disticha; Lindley
B. pulchella; Meissner
B. peduncularis; Turczanino.
B. rufa; Brown

TEMPLETONIA; Brown

T. retusa; Brown
T. Drummondii; Bentham
T. aculeata; Bentham
T. egena; Bentham
T. Battii; F. v. M.
T. sulcata; Bentham

HOVEA; Brown

H. acanthoclada; F. v. M.
H. chorizemifolia; De Candolle
H. Celsi; Bonpland
H. trisperma; Bentham
H. stricta; Meissner
H. pungens; Bentham

GOODIA; Salisbury

G. lotifolia; Salisbury
G. medicaginea; F. v. M.

CROTALARIA; Hermann

C. Novae-Hollandiae; De Candolle
C. Cunninghamii; Brown
C. medicaginea; Lamarck
C. incana; Linne
C. dissitiflora; Bentham

TRIGONELLA; Linne

T. suavissima; Lindley

LOTUS; Tournefort

L. Australis; Andrews

PSORALEA; Linne

P. pustulata; F. v. M.
P. eriantha; Bentham
P. patens; Lindley
P. cinerea; Lindley
P. leucantha; F. v. M.

INDIGOFERA; Royen

I. linifolia; Retzius
I. viscosa; Lamarck
I. monophylla; De Candolle
I. Australis; Willdenow
I. brevidens; Bentham

PTYCHOSEMA; Bentham

P. pusillum; Bentham
P. trifoliolatum; F. v. M.

TEPHROSIA; Persoon

T. purpurea; Persoon

SESBANIA; Scopoli

S. grandiflora; Persoon
S. aculeata; Persoon

CLIANTHUS; Banks & Solander

C. Dampieri; Cunningham

SWAINSONIA; Salisbury

S. phacoides; Bentham
S. Burkei; F. v. M.
S. oligrophylla; F. v M.
S. occidentalis; F. v. M.
S. stenodonta; F. v. M.
S. gracilis; Bentham
S. Drummondii; Bentham
S. Oliveri; F. v. M.
S. canescens; F. v. M.
S. Beasleyana; F. v. M.
S. stipularis; F. v. M.
S. Kingii; F. v. M.
S. unifoliolata; F. v. M.
S. microphylla; A. Gray
S. colutoides; F. v. M.
S. Macullochiana; F. v. M.

GLYCYRRHIZA; Tournefort

G. psoraleoides; Bentham

ABSCHYNOMENE; Linne

A. Indica; Linne

GLYCINE; Linne

G. clandestina; Wendland
G. tabacina; Bentham
G. sericea; Bentham

KENNEDYA; Ventenat

K. nigricans; Lindley
K. Beckxiana; F. v. M.
K. prorepens; F. v. M.
K. prostrata; Brown
K. bracteata; Gaudichaud
K. eximia; Lindley
K. microphylla; Meissner
K. parviflora; Meissner
K. Stirlingii; Lindley
K. glabrata; Lindley
K. macrophylla; F. v. M.
K. coccinea; Ventenat
K. Comptoniana; Link

ERYTHRINA; Linne

E. vespertilio; Bentham

CANAVALIA; De Candolle

C. obtusifolio; De Candolle

VIGNA; Savi

V. lanceolata; Bentham

CAJANUS; De Candolle

C. cinereus; F. v. M.

RHYNCHOSIA; Loureiro

R. minima; De Candolle

ABRUS; Dalechamps

A. precatorius; Linne

CASSIA; Tournefort

C. venusta; F. v. M.
C. notabilis; F. v. M.
C. pleurocarpa; F. v. M.
C. Chatelainiana; Gaudichaud
C. Cuthbertsoni; F. v. M.
C. phyllodinea; Brown
C. eremophila; Cunningham
C. artemisioides; Gaudichaud
C. Sturtii; Brown
C. desolata; F. v. M.
C. cardiosperma; F. v. M.
C. concinna; Bentham

PETALOSTYLIS; Brown

P. labicheoides; Brown

LABICHEA; Gaudichaud

L. cassioides; Gaudichaud
L. lanceolata; Bentham
L. punctata; Bentham

BAUHINIA; Plumier

B. Leichhardtii; F. v M.

NEPTUNIA; Loureiro

N. gracilis; Benth.

ACACIA; Tournefort

I. ALATAE.

A. glaucoptera; Bentham
A. alata; Brown
A. diptera; Findley
A. stenoptera; Bentham

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

II. Continuae.

A. incurva; Bentham
A. trigonophylla; Meissner

III. Pungentes.

A. cochlearis; H. L. Wendland
A. colletioides; Cunningham
A. striatula; Bentham
A. campylophylla; Bentham
A. teretifolia; Bentham
A. sulcata; Brown
A. costata; Bentham
A. barbinervis; Bentham
A. ataxiphylla; Bentham
A. Baxteri; Bentham
A. aureo-nitens; Lindley
A. quadrisulcata; F. v. M.
A. erioclada; Bentham
A. patens; F. v. M.
A. laricina; Meissner
A. genistoides; Cunningham
A. sphacelata; Bentham
A. ingrata; Bentham

IV. Calamiformes.

A. volubilis; F. v. M.
A. tetragonocarpa; Meissner
A. restiacea; Bentham
A. squamata; Lindley
A. brachyphylla; Bentham
A. Bynoeana; Bentham
A. triptycha; F. v. M.
A. leptoneura; Bentham
A. papyrocarpa; Bentham
A. spodiosperma; F. v. M.
A. scirpifolia; Meissner
A. extensa; Lindley
A. gonophylla; Bentham
A. ericifolia; Bentham
A. uncinella; Bentham

V. Brunioidae.

A. Rossei; F. v. M.
A. cedroides; Bentham

VI. Uninervis.

A. scabra; Bentham
A. nodiflora; Bentham
A. spinosissima; Bentham
A. ulicina; Meissner
A. erinacea; Bentham
A. Huegelii; Bentham
A. nervosa; De Candolle
A. obovata; Bentham
A. congesta; Bentham
A. dermatophylla; Bentham
A. armata; Brown
A. idiomorpha; Cunningham
A. Shuttleworthii; Meissner
A. pilosa; Bentham
A. crispula; Bentham
A. crassistipulea; Bentham
A. hastulata; Smith
A. horridula; Meissner
A. Merralliana; F. v. M.
A. divergens; Bentham
A. biflora; Brown
A. decipiens; Brown
A. cuneata; Bentham
A. dilatata; Bentham
A. bidentata; Bentham
A. acanthoclada; F. v. M.
A. lachnophylla; F. v. M.
A. triquetra; Bentham
A. ligustrina; Meissner
A. Meissneri; Lehmann
A. Tysoni; Luehmann
A. anceps; De Candolle
A. dura; Bentham
A. spathulata; F. v. M.
A. ramosissima; Bentham
A. Dempsteri; F. v. M.
A. Sentis; F. v. M.
A. dentifera; Bentham
A. sclerosperma; F. v. M.
A. amblyphylla; F. v. M.
A. microbotrya; Bentham
A. leiophylla; Bentham
A. cyanophylla; Lindley
A. notabilis; F. v. M.
A. salicina; Lindley
A. rostellifera; Bentham
A. crassiuscula; H. L. Wendland
A. Harveyi; Bentham
A. subcoerulea; Lindley
A. Graffiana; F. v. M.
A. Lindleyi; Meissner
A. leptopetala; Bentham
A. pyrifolia; De Candolle
A. myrtifolia; Willdenow

VII. Plurinervis.

A. scalpelliformis; Meissner
A. urophylla; Bentham
A. adnata; F. v. M.
A. stipulosa; F. v. M.
A. loxophylla; Bentham
A. impressa; F. v. M.
A. bivenosa; De Candolle
A. nitidula; Bentham
A. heteroclita; Meissner
A. leptospermoides; Bentham
A. Oswaldi; F. v. M.
A. lineolata; Bentham
A. quadrimarginea; F. v. M.
A. coriacea; De Candolle
A. sclerophylla; Lindley
A. heteroneura; Bentham
A. ixiophylla; Bentham
A. dictyophleba; F. v. M.
A. cyclops; Cunningham
A. dineura; F. v. M.

VIII. Juliferae.

A. craspedocarpa; F. v. M.
A. stipuligera; F. v. M.
A. acradenia; F. v. M.
A. cochliocarpa; Meissner
A. aciphylla; Bentham
A. palustris; Luehmann
A. ephedroides; Bentham
A. microneura; Meissner
A cyperophylla; F. v. M.
A. multispicata; Bentham
A. oncinophylla, Lindley
A. aneura; F. v. M.
A. sibirica; S. Moore
A. cibaria; F. v. M.
A. Cuthbertsoni; Luehmann
A. Doratoxylon; Cunningham
A. acuminata; Bentham
A. stereophylla; Meissner
A. signata; F. v. M.
A. tumida; F. v. M.
A. denticulosa; F. v. M.

IX. Bipinnatae.

A. Drummondii, Lindley
A. pulchella; Brown
A. pentadenia; Lindley
A. Gilberti; Meissner
A. nigricans; Brown
A. Tayloriana; F. v. M.
A. strigosa; Link
A. Farnesiana; Willdenow
A. suberosa; Cunningham

Alexia; Durazzini

A. lophantha; Bentham

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

ROSACEAE.—A. L. DE JUSSIEU.

SPILOBASIUM; Desfontaines
S. spathulatum; Desfontaines
S. linearis; Nees

ACAENA; Mutis
A. ovina; Cunningham

SAXIFRAGEAE.—VENTENAT.

APHANOPHALUM; Endlicher
A. occidentale; F. v. M.

BRIMOSYNE; Endlicher
B. pectinata; Endlicher

CEPHALOTUS; Labillardiere
C. follicularis; Labillardiere

CRASSULACEAE.—DE CANDOLLE.

TILLAEA; Michell
T. verticillaris; De Candolle
T. purpurata; J. Hooker
T. pedicellosa; F. v. M.
T. intricata; Nees
T recurva; J. Hooker

ONAGREAE.—ADANSON.

EPILOBIUM; Dillenius
E. glabellum; G. Forster

SALICARIEAE.—ADANSON.

ROTALA; Linne
R. verticillaris; Linne

AMMANNIA; Houston
A. multiflora; Roxburgh

LYTHRUM; Linne
L. Hyssopifolia; Linne

HALORAGEAE.—BROWN.

LOUDONIA; Lindley
L. aurea; Lindley
L. Roei; Schlechtendal

HALORAGIS; R. et. G. Forster.
H. Gossei; F. v. M.
H. trigonocarpa; F. v. M.
H. digyna; Labillardiere
H. mucronata; Bentham
H. pityoides; Bentham
H. cordigera; Fenzl
H. tenuifolia; Bentham
H. scoparia; Fenzl
H. aculeolata; Bentham
H. foliosa; Bentham
H. pycnostachya; F. v. M.
H. confertifolia; F v. M.
H. platycarpa; Bentham
H. hexandra; F. v. M.
H. aspera; Lindley
H. racemosa; Labillardiere
H. rotundifolia; Bentham
H. rudis; Bentham
H. paniculata; Brown
H. pusilla; Brown
H. intricata; Bentham
H. nodulosa; Walpers
H. trichostachya; Bentham
H. lanceolata; Brown
H. teucrioides; Schlechtendal
H. scordioides; Bentham
H. Meionectes; F. v. M.

MYRIOPHYLLUM; l'Ecluse
M. varifolium; J. Hooker
M. verrucosum; Lindley
M. Muelleri; Sonder
M. pedunculatum; J. Hooker
M. integrifolium; J. Hooker
M. Drummondii; J. Hooker

CALLITRICHINAE.—LINK.

CALLITRICHE; Linne
C. verna; Linne

COMBRETACEAE.—BROWN.

TERMINALIA; Linne
T. circumalata; F. v. M.

GYROCARPUS; N. Jacquin
G. Americanus; N. Jacquin

MYRTACEAE.—ADANSON

ACTINODIUM; Schauer
A. Cunninghamii.; Schauer

DARWINIA; Rudge
D. macrostegia; Bentham
D. Hookeriana; Bentham
D. fimbriata; Bentham
D. speciosa; Bentham
D. Meissneri; Bentham
D. helichrysoides; Bentham
D. Neildiana; F. v. M.
D. Luehmanni; F. v. M. & Tate
D. oederoides; Bentham
D. virescens; Bentham
D. Oldfeldii; Bentham
D. purpurea; Bentham
D. citriodora; Bentham
D. thymoides; Bentham
D. vestita; Bentham
D. pauciflora; Bentham
D. diosmoides; Bentham
D. pinifolia; Bentham
D. rhadinophylla; F. v. M.
D. sanguinea; Bentham
D. verticordina; Bentham
D. ciliata; F. v. M.
D. gracilis; F. v. M.
D. Forrestii; F. v. M.
D. heterandra; F. v. M.
D. Drummondii.; F. v. M.
D. Endlicheri; F. v. M.
D. brevifolia; F. v. M.
D. uncinata; F. v. M.
D. megalopetala; F. v. M.
D. Turczaninowii; F. v. M.
D. axillaris; F. v. M.

VERTICORDIA; De Candolle
V. densiflora; Lindley
V. stelluligera; Meissner
V. minutiflora; F. v. M.
V. Fontainesii; De Candolle
V. helichrysantha; F. v. M.
V. Brownii; De Candolle
V. fastigiata; Turczaninow
V. Harveyi; Bentham
V. fimbrilepis; Turczaninow
V. serrata; Schauer
V. nitens; Schauer
V. grandiflora; Endlicher
V. chrysantha; Endlicher
V. Preissii; Schauer
V. acerosa; Lindley
V. polytricha; Bentham
V. oxylepis; Turczaninow
V. humilis; Bentham
V. penicillaris;. F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

V. multiflora; Turczaninow
V. Huegelii; Endlicher
V. insignis; Endlicher
V. Roei; Endlicher
V. habrantha; Schauer
V. monadelpha; Turczaninow
V. Lehmanni; Schauer
V. Jamiesonii; F. v. M.
V. picta; Endlicher
V. Helmsii; S. Moore
V. pennigera; Endlicher
V. Drummondii; Schauer
V. Hughani; F. v. M.
V. pholidophylla; F. v. M.
V. spicata; F. v. M.
V. lepidophylla; F. v. M.
V. Forrestii; F. v. M.
V. ovalifolia; Meissner
V. Rennieana; F. v. M.
V. chrysostachya; Meissner
V. oculata; Meissner
V. grandis; Drummond

PILEANTHUS; Labillardiere

P. peduncularis; Endlicher
P. Limacis; Labillardiere
P. filifolius; Meissner

CALYCOTHRIX Labillardiere

C. aurea; Lindley
C. puberula; Meissner
C. flavescens; Cunningham
C. asperula; Schauer
C. sapphirina; Lindley
C. breviseta; Lindley
C. simplex; Lindley
C. empetroides; Schauer
C. variabilis; Lindley
C. muricata; F. v. M.
C. gracilis; Bentham
C. brevifolia; Meissner
C. brachyphylla; Turczaninow
C. desolata; S. Moore
C. Leschenaultii; Schauer
C. Oldfieldii; Bentham
C. glutinosa; Lindley
C. angulata; Lindley
C. depressa; Turczaninow
C. tenuifolia; Meissner
C. strigosa; Cunningham
C. Watsoni; F. v. M. & Tate
C. plumulosa; F. v. M.
C. decandra; Brown
C. Birdii; F. v. M.
C. tenuiramea; Turczaninow
C. Fraseri; Cunningham
C. granulosa; Bentham
C. Creswelli; F. v. M.
C. tetragona; Labillardiere

LHOTZKYA; Schauer

L. violacea; Lindley
L. ciliata; F. v. M.
L. brevifolia; Schauer
L. purpurea; F. v. M.
L. ericoides; Schauer
L. acutifolia; Lindley
L. Harvestiana; F. v. M.

THRYPTOMENE Endlicher

T. mucronulata; Turczaninow
T. Australis; Endlicher
T. tenella; Bentham
T. prolifera; Turczaninow
T. saxicola; Schauer
T. Helmsii; F. v. M. & Tate
T. Johnsonii; F. v. M.
T. racemulosa; Turczaninow
T. denticulata; Bentham
T. baeckeacea; F. v. M.
T. strongylophylla; F. v. M.
T. hyporhytis; Turczaninow
T. Maisonneuvii; F. v. M.
T. urceolaris; F. v. M.
T. stenocalyx; F. v. M.
T. oligandra; F. v. M.
T. elobata; F. v. M.
T. racemosa; F. v. M.
T. trachycalyx; F. v. M.
T. imbricata; F. v. M.
T. flaviflora; F. v. M.
T. Drummondii; F. v. M.
T. hymenonema; F. v. M.

WEHLIA; F. v. M.

W. thryptomenoides; F. v. M.
W. coarctata; F. v. M.
W. staminosa; F. v. M.

BABOKEA; Linne

B. platystemones; Bentham
B. Fumana; F. v. M.
B. dimorphandra; F. v. M.
B. schollerifolia; Lehmann
B. oxycocoides; Bentham
B. Drummondii; Bentham
B. crassifolia; Lindley
B. cryptandroides; F. v. M.
B. tetragona; F. v. M.
B. crenulata; Brown
B. arbuscula; Brown
B. astarteoides; Bentham
B. Behrii; F. v. M.
B. uncinella; Bentham
B. polyandra; F. v. M.
B. corynophylla F. v. M.
B. pachyphylla; Bentham
B. crispiflora; F. v. M.
B. Blackettii; F. v. M.
B. camphorosmae Endlicher
B. pulchella; De Candolle
B. ochropetala; F. v. M.
B. pygmaea; Brown
B. corymbulosa; Bentham
B. floribunda; Bentham
B. pentandra; F. v. M.
B. pentagonantha; F. v. M.
B. robusta; F. v. M.
B. ovalifolia; F. v. M.
B. subcuneata; F. v. M.
B. grandiflora; Bentham
B. uberiflora; F. v. M.
B. involucrata; Endlicher
B. spathulata; F. v. M.
B. ciliata; F. v. M.
B. capitata; F. v. M.
B. umbellifera; F. v. M.
B. laxiflora; F. v. M.
B. leptantha; F. v. M.
B. parviflora; F. v. M.
B. oligandra; F. v. M.
B. serpillifolia; F. v. M.
B. teretifolia; F. v. M.

ASTARTEA; De Candolle

A. ambigua; F. v. M.
A. fascicularis; De Candolle

HYPOCALYMMA; Endlicher

H. xanthopetalum; F. v. M.
H. robustum; Endlicher
H. longifolium; F. v. M.
H. strictum; Schauer
H. tetrapterum; Turczaninow
H. linifolium; Turczaninow
H. angustifolium; Endlicher
H. ericifolium; Bentham

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

H. cordifolium; Lehmann
H. speciosum; Turczaninow
H. Phillipsii; Harvey
H. myrtifolium; Turczaninow

BALAUSTION; Hooker

B. pulcherrimum; Hooker

AGONIS; De Candolle

A. spathulata; Schauer
A. floribunda; Turczaninow
A. marginata; De Candolle
A. linearifolia; De Candolle
A. juniperina; Schauer
A. parviceps; Schauer
A. obtusissima; F. v. M.
A. flexuosa; De Candolle
A. undulata; Bentham
A. hypericifolia; Schauer
A. grandiflora; Bentham

LEPTOSPERMUM; R. et G. Forster

L. firmum; Bentham
L. spinescens; Endlicher
L. erubescens; Schauer
L. Roei; Bentham
L. floridum; Bentham
L. ellipticum; Endlicher
L. crassipes; Lehmann

KUNZEA; Reichenbach

K. micrantha; Schauer
K. eriocalyx; F. v. M.
K. ericifolia; Reichenbach
K. Preissiana; Schauer
K. recurva; Schauer
K. micromera; Schauer
K. pauciflora; Schauer
K. sericea; Turczaninow
K. Baxteri; Schauer

CALLISTEMON; Brown

C. speciosus; De Candolle
C. phoeniceus; Lindley

MELALEUCA; Linne

M. macronychia; Turczaninow
M. lateritia; Otto
M. calothamnoides; F. v. M.
M. blaeriaefolia; Turczaninow
M. diosmifolia; Andrews
M. elliptica; Labillardiere
M. fulgens; Brown
M. acuminata; F. v. M.
M. leptoclada; Bentham
M. basicephala; Bentham
M. violacea; Lindley
M. cardiophylla; F. v. M.
M. undulata; Bentham
M. depauperata; Turczaninow
M. lateriflora; Bentham
M. exarata; F. v. M.
M. teretifolia; Endlicher
M. Baxteri; Bentham
M. adnata; Turczaninow
M. radula; Lindley
M. pulchella; Brown
M. conferta; Bentham
M. Leucadendron; Linne
M. lasiandra; F. v. M.
M. spicigera; S. Moore
M. Huegelii; Endlicher
M. acerosiflora; F. v. M.
M. parviflora; Lindley
M. laxiflora; Turczaninow
M. hamulosa; Turczaninow
M. subfalcata; Turczaninow
M. glaberrima; F. v. M.
M. rhaphiophylla; Schauer
M. symbifolia; Bentham
M. cuticularis; Labillardiere
M. sparsiflora; Turczaninow
M. calycina; Brown
M. cordata; Turczaninow
M. globifera; Brown
M. megacephala; F. v. M.
M. nesophila; F. v. M.
M. Oldfieldii; F. v. M.
M. uncinata; Brown
M. concreta; F. v. M.
M. filifolia; F. v. M.
M. glomerata; F. v. M.
M. pentagona; Labillardiere
M. ciliosa; Turczaninow
M. polycephala; Bentham
M. spathulata; Schauer
M. eriantha; Bentham
M. subtrigona; Schauer
M. seriata; Lindley
M. scabra; Brown
M. urceolaris; F. v. M.
M. trichophylla; Lindley
M. holosericea; Schauer
M. densa; Brown
M. thymoides; Labillardiere
M. striata; Libillardiere
M. polygaloides; Schauer
M. incana; Brown
M. pungens; Schauer
M. viminea; Lindley
M. microphylla; Smith
M. tenella; Bentham
M. leiocarpa; F. v. M.
M. leiopyxis; F. v. M.
M. acerosa; Schauer
M. pauperiflora; F. v. M.
M. aspalathoides; Schauer
M. cucullata; Turczaninow
M. micromera; Schauer
M. thuyoides; Turczaninow
M. quadrifaria; F. v. M.

CONOTHAMNUS; Lindley

C. trinervis; Lindley
C. divaricatus; Bentham

BEAUFORTIA; Brown

B. sparsa; Brown
B. decussata; Brown
B. squarrosa; Schauer
B. orbifolia; F. v. M.
B. anisandra; Schauer
B. marcrostemon; Lindley
B. heterophylla; Turczaninow
B. Schaueri; Preiss
B. purpurea; Lindley
B. Dampieri; Cunningham
B. elegans; Schauer
B. interstans; F. v. M.
B. micrantha; Schauer

REGELIA; Schauer

R. grandiflora; Bentham
R. ciliata; Schauer
R. inops; Schauer

PHYMATOCARPUS; F. v. M.

P. porphyrocephalus; F. v. M.
P. Maxwelli; F. v. M.

CALOTHAMNUS; Labillardiere

C. pachystachyus; Bentham
C. longissimus F. v. M.
C. blepharantherus; F. v. M.
C. sanguineus; Labillardiere;
C. torulosus; Schauer
C. gibbosus; Bentham
C. gracilis; Brown
C. blepharospermus; F. v. M.
C. Gilesii; F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

C. chrysantherus; F. v. M.
C. Oldfieldii; F. v. M.
C. planifolius; Lehmann
C. lateralis; Lindley
C. affinis; Turczaninow
C. Preissii; Schauer
C. Schaueri; Lehmann
C. Lehmanni; Schauer
C. villosus; Brown
C. pinifolius; F. v. M.
C. rupestris; Schauer
C. quadrifidus; Brown
C. asper; Turczaninow
C. homalophyllus; F. v. M.

LAMARCHEA; Gaudichaud
L. hakeaefolia; Gaudichaud

EREMEAE; Lindley
E. fimbriata; Lindley
E. acutifolia; F. v. M.
E. violacea; F. v. M.
E. pilosa; Lindley
E. ebracteata; F. v. M.
E. beaufortioides; Bentham

EUCALYPTUS; L'Heritier.

I. RENANTHERAE.
E. sepulcralis; F. v. M.
E. buprestium; F. v. M.
E. marginata; Donn
E. santalifolia; F. v. M.

II. PORANTHERAE;
E. gracilis; F. v. M.
E. ucinata; Turczaninow

III. PARALLELANTHERAE.
E. decipiens; Endlicher
E. concolor; Schauer
E. microtheca; F. v. M.
E. pyriformis; Turczaninow
E. macrocarpa; Hooker
E. Preissiana; Schauer
E. megacarpa; F. v. M.
E. erythronema; Turczaninow
E. caesia; Bentham
E. tetraptera; Turczaninow
E. corrugata; Luehmann
E. incrassata; Labillardiere
E. oleosa; F. v. M.
E. torquata; Luehmann
E. goniantha; Turczaninow
E. falcata; Turczaninow
E. salmonophloia; F. v. M.
E. leptopoda; Bentham
E. salubris; F. v. M.
E. augustissima; F. v. M.
E. Doratoxylon; F. v. M.
E. Kruseana; F. v. M.
E. decurva; F. v. M.
E. Cooperiana; F. v. M.
E. gomphocephala; De Candolle
E. Oldfieldii; F. v. M.
E. orbifolia; F. v. M.
E. diversicolor; F. v. M.
E. patens; Bentham
E. Todtiana; F. v. M.
E. rostrata; Schlechtendal
E. rudis; Endlicher
E. Campaspe; S. Moore
E. foecunda; Schauer
E. redunca; Schauer
E. grossa; F. v. M.
E. obcordata; Turczaninow
E. occidentalis; Endlicher
E. cornuta; Labillardiere
E. gamophylla; F. v. M.
E. setosa; Schauer
E. calophylla; Brown
E. ficifolia; F. v. M.
E. terminalis; F. v. M.
E. odontocarpa; F. v. M.
E. erythrocorys; F. v. M.
E. tetragona; F. v. M.
E. eudesmioides; F. v. M.

BARRINGTONIA; R. & G. Forster
B. acutangula Gaertner

RHAMNACEAE.—A. L. DE JUSSIEU

POMADERRIS; Labillardiere
P. myrtilloides; Fenzl
P. grandis; F. v. M.
P. Forrestiana; F. v. M.
P. obcordata; Fenzl
P. intangenda; F. v. M.

CRYPTANDRA; Smith
C. albicans; F. v. M.
C. Billardieri; F. v. M.
C. iedifolia; F. v. M.
C. augustifolia; F. v. M.
C. Wichureae; F. v. M.
C. (Trymalium) Myrtillus; S. Moore
C. spyridioides; F. v. M.
C. scoparia; Reisseck
C. nutans; Steudel
C. glabriflora; Bentham
C. Leucopogon; Meissner
C. parvifolia; Turczaninow
C. pungens; Steudel
C. mutila; Nees
C. petraea; S. Moore
C. arbutiflora; Fenzl
C. miliaris; Reisseck
C. nudiflora; F. v. M.
C. pomaderroides; Reisseck
C. pumila; F. v. M.
C. leucophracta; Schlechtendal
C. coronata; Reisseck
C. humilis; F. v. M.
C. tridentata; Steudel
C. divaricata; F. v. M.
C. spadicea; F. v. M.
C. globulosa; F. v. M.
C. cordata; Turczaninow
C. rotundifolia; F. v. M.
C. complicata; F. v. M.
C. westringifolia; F. v. M.
C. villosa; Turczaninow
C. pauciflora; Turczaninow
C. subochreata; F. v. M.
C. vexillifera; Hooker

VINIFERAE.—J. DE ST. HILLAIRE.

VITIS; Tournefort
V. augustissima; F. v. M.

ARALIACEAE.—VENTENAT.

ASTROTRICHA; De Candolle
A. Hamptoni; F. v. M.

UMBELLIFERAE.—MORISON

HYDROCOTYLE, Tournefort
H. hirta; Brown
H. corynophora; F. v. M.
H. plebeja; Brown
H. medicaginoides; Turczaninow
H. muriculata; Turczinanow
H. callicarpa; Bunge
H. scutellifera; Bentham
H. hispidula; Bunge
H. pilifera; Turczaninow
H. capillaris; F. v. M.
H. rugulosa; Turczaninow
H. diantha; De Candolle
H. lemnoides; Bentham
H. alata; Brown

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

H. tetragonocarpa; Bunge
H. blepharocarpa; F. v. M.
H. glochidiata; Bentham
H. hexalocarpa; F. v. M.
H. Asiatica; Linne

DIDISCUS; De Candolle

D. pusillus; F. v. M.
D. Croninianus; F. v. M.
D. cyanopetalus; F. v. M.
D. eriocarpus; F. v. M.
D. elachocarpus; F. v. M.
D. (Trachymene) juncea; S. Moore
D. coeruleus; De Candolle
D. pilosus: Bentham
D. glaucifolius; F. v. M.

TRACHYMENE; Rudge

T. compressa; Rudge
T. juncea; Bunge
T. haplosciadea; F. v. M.
T. Maxwelli; F. v. M.
T. cirrosa; F. v. M.
T. tenuissima; F. v. M.
T. dissecta; F. v. M.
T. commutata; Turczaninow
T. effusa; Turczaninow
T. deflexa; Turczaninow
T. Eatoniae; F. v. M.

XANTHOSIA; Rudge

X. juncea; Bentham
X. tenuior; Bentham
X. peltigera; Steudel
X. hederifolia; Bentham
X. candida; Steudel
X. singuliflora, F. v. M.
X. ciliata; Hooker
X. pusilla; Bunge
X. fruticulosa; Bentham
X. Huegelii; Steudel
X. peduncularis; Bentham
X. Atkinsoniana; F. v. M.
X. rotundifolia; De Candolle

ACTINOTUS; Labillardiere

A. leucocephalus; Bentham
A. omnifertilis; Bentham
A. rhomboideus; Bentham
A. glomeratus; Bentham

ERYNGIUM; Tournefort

E. rostratum; Cavanilles
E. vesiculosum; Labillardiere

APIUM; Tournefort

A. prostratum; Labillardiere

DAUCUS; Tournefort

D. brachiatus; Sieber

SYNPETALEAE PERIGYNAE.—F. v. M.

OLACINEAE.—MIRBEL.

OLAX; Linne

O. phyllanthi; Brown
O. Benthamiana; Miquel

SANTALACEAE;.—BROWN.

EXOCARPOS; Labillardiere

E. odorata; A. de Candolle
E. cupressiformis; Labillardiere
E. spartea; Brown
E. aphylla; Brown

ANTHOBOLUS; Brown

A. foveolatus; F. v. M.
A. exocarpoides; F. v. M.

LEPTOMERIA; Brown

L. spinosa; A. de Candolle
L. Preissiana; A. de Candolle
L. pauciflora; Brown
L. scrobiculata; Brown
L. squarrulosa; Brown
L. Cunninghamii; Miquel
L. empetriformis; Miquel
L. axillaris; Brown
L. laxa; Miquel
L. obovata; Miquel

CHORETRUM; Brown

G. glomeratum; Brown

SANTALUM; Linne

S. lanceolatum; Brown
S. acuminatum; A. de Candolle
S. persicarium; F. v. M.
S. cygnorum; Miquel

LORANTHACEAE.—A. L. DE JUSSIEU.

LORANTHUS; Linne

L. linearifolius; Hooker
L. Murrayi; Tate
L. Exocarpi; Behr
L. acacioides; Cunningham
L. linophyllus; Fenzl
L. gibberulosus; Tate
L. pendulus; Sieber
L. Quandang; Lindley
L. grandibracteus; F. v. M.
L. Nestor; S. Moore

NUYTSIA; Brown

N. floribunda; Brown

PROTEACEAE.—A. L. DE JUSSIEU.

PETROPHILA; Brown

P. teretifolia; Brown
P. longifolia; Brown
P. media; Brown
P. acicularis; Brown
P. megalostegia; F. v. M.
P. linearis; Brown
P. anceps; Brown
P. heterophylla; Lindley
P. biloba; Brown
P. propinqua; Brown
P. squamata; Brown
P. colorata; Meissner
P. striata; Brown
P. divaricata; Brown
P. Serruriae; Brown
P. inconspicua; Meissner
P. trifida; Brown
P. cardiacea; Meissner
P. Shuttleworthiana; Meissner
P. marcrostachya; Brown
P. diversifolia; Brown
P. biternata; Meissner
P. plumosa; Meissner
P. ericifolia; Brown
P. chrysantha; Meissner
P. fastigiata; Brown
P. seminuda; Lindley
P. circinata; Kippist
P. Drummondii; Meissner
P. crispata; Brown
P. rigida; Brown
P. *conifera*; Meissner
P. *semifurcata*; F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

ISOPOGON; Brown

I. latifolius; Brown
I. cuneatus; Brown
I. linearis; Meissner
I. polycephalus; Brown
I. attenuatus; Brown
I. sphaerocephalus; Lindley
I. uncinatus; Brown
I. buxifolius; Brown
I. axillaris; Brown
I. tridens; F. v. M.
I. Baxteri; Brown
I. roseus; Lindley
I. adenanthoides; Meissner
I. trilobus; Brown
I. tripartitus; Brown
I. longifolius; Brown
I. Drummondii; Bentham
I. heterophyllus; Meissner
I. villosus; Meissner
I. teretifolius; Brown
I. anethifolius; Brown
I. asper; Brown
I. crithmifolius; F. v. M.
I. formosus; Brown
I. divergens; Brown
I. scabriusculus; Meissner

ADENANTHOS; Labillardiere

A. Detmoldi; F. v. M.
A. barbigerus; Lindley
A. obovatus; Labillardiere
A. cuneatus; Labillardiere
A. Cunninghami; Meissner
A. pungens; Meissner
A. venosus; Meissner
A. Dobsoni; F. v. M.
A. Forrestii; F. v. M.
A. linearis; Meissner
A. sericeus; Labillardiere
A. Meissneri; Lehmann
A. filifolius; Bentham
A. flavidiflorus; F. v. M.
A. apiculatus; Brown

SIMSIA; Brown

S. simplex; F. v. M.
S. abrotanoides; F. v. M.
S. teretifolia; F. v. M.
S. tenuifolia; Brown
S. latifolia; Brown

SYNAPHEA; Brown

S. polymorpha; Brown
S. dilatata; Brown
S. favosa; Brown
S. Preissii; Meissner
S. acutiloba; Meissner
S. petiolaris; Brown
S. decorticans; Lindley
S. pinnata; Lindley

CONOSPERMUM; Smith

C. capitatum; Brown
C. petiolare; Brown
C. teretifolium; Brown
C. flexuosum; Brown
C. acerosum; Lindley
C. amoenum; Meissner
C. nervosum; Meissner
C. diffusum; Bentham
C. glumaceum; Lindley
C. ephedroides; Kippist
C. Toddii; F. v. M.
C. polycephalum; Meisner
C. coeruleum; Brown
C. debile; Kippist
C. scaposum; Bentham
C. Huegelii; Brown
C. densiflorum; Lindley
C. Brownii; Meissner
C. distichum; Brown
C. floribundum; Bentham
C. incurvum; Lindley
C. brachyphyllum; Lindley
C. stoechadis; Endlicher
C. triplinervium; Brown
C. bracteosum; Meissner
C. crassinervium; Meissner

FRANKLANDIA; Brown

F. fucifolia; Brown
F. triaristata; Bentham

PERSOONIA; Smith

P. hakeiformis; Meissner
P. teretifolia; Brown
P. saccata; Brown
P. Saundersiana; Kippist
P. diadena; F. v. M.
P. comata; Meissner
P. brachystylis; F. v. M.
P. trinervis; Meissner
P. tortifolia; Meissner
P. augustiflora; Bentham
P. rudis; Meissner
P. microcarpa; Brown
P. sulcata; Meissner
P. acicularius; F. v. M.
P. scabrella; Meissner
P. dilwynioides; Meissner
P. striata; Brown
P. quinquenervis; Hooker
P. rufiflora; Meissner
P. scabra; Brown
P. graminea; Brown
P. longifolia; Brown
P. articulata; Brown
P. elliptica; Brown
P. Leucopogon; S. Moore

XYLOMELUM; Smith

X. occidentale; Brown
X. augustifolium; Kippist

LAMBERTIA; Smith

L. uniflora; Brown
L. rariflora; Meissner
L. inermis; Brown
L. ericifolia; Brown
L. multiflora; Lindley
L. echinata; Brown
L. ilicifolia; Hooker

STRANGEA; Meissner

S. cynanchocarpa; F. v. M.

GREVILLEA; Brown

G. Pinaster; Meissner
G. obtusifolia; Meissner
G. sparsiflora; F. v. M.
G. macrostylis; F. v. M.
G. tripartita; Meissner
G. platypoda; F. v. M.
G. patentiloba; F. v. M.
G. pectinata; Brown
G. plurijuga; F. v. M.
G. nudiflora; Meissner
G. Helmsiana; F. v. M. & Tate
G. stenomera; F. v. M.
G. Thelemanniana; Endlicher
G. concinna; Brown
G. Hookeriana; Meissner
G. Baxteri; Brown
G. eriobotrya; F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

G. pterosperma; F. v. M.
G. stenobotrya; F. v. M.
G. eriostachya; Lindley
G. thyrsoides; Meissner
G. cirsiifolia; Meissner
G. bipinnatifida; Brown
G. armigera; Meissner
G. asparagoides; Meissner
G. Treueriana; F. v. M.
G. juncifolia; Hooker
G. Wilsoni; Cunningham
G. erectiloba; F. v. M.
G. insignis; Kippist
G. Brownii; Meissner
G. fasciculata; Brown
G. aspera; Brown
G. brachystylis; Meissner
G. saccata; Bentham
G. Drummondii; Meissner
G. deflexa; F. v. M.
G. disjuncta; F. v. M.
G. haplantha; F. v. M.
G. extorris; S. Moore
G. pinifolia; Meissner
G. acuaria; F. v. M.
G. aculeolata; S. Moore
G. pauciflora; Brown
G. quercifolia; Brown
G. Wickhami; Meissner
G. agrifolia; Cunningham
G. Huegelii; Meissner
G. Sarissa; S Moore
G. retracta; Brown
G. annulifera; F v. M.
G. leucopteris; Meissner
G. striata; Brown
G. occidentalis; Brown
G. acerosa; F. v M.
G. umbellulata; Meissner
G. oxystigma; Meissner
G Candolleana; Meissner
G. scabra; Meissner
G. commutata; F. v. M.
G. pinnatisecta; F. v. M.
G. argyrophylla; Meissner
G. brachystachya; Meissner
G. Endlicheriana; Meissner
G. manglesoides; Meissner
G. diversifolia; Meissner
G. filifolia; Meissner
G. hakeoides; Meissner
G. teretifolia; Meissner
G. eryngioides; Bentham
G. bracteosa; Meissner
G. crithmifolia; Brown
G. trachytheca; F. v. M.
G. monticola; Meissner
G. Muelleri; Bentham
G. trifida; Meissner
G. Synapheae; Brown
G. flexuosa; Meissner
G. leptobotrya; Meissner
G. brevicuspis; Meissner
G. intricata; Meissner
G. didymobotrya; Meissner
G. polybotrya; Meissner
G. nematophylla; F. v. M.
G. paradoxa; F. v. M.
G petrophiloides; Meissner
G tenuiflora; Meissner
G pulchella; Meissner
G. rudis; Meissner
G. apiciloba; F. v. M.
G. Shuttleworthiana; Meissner
G. integrifolia; Meissner
G. stenocarpa; F. v. M.
G. acrobotrya; Meissner
G. glabrata; Meissner
G. ornithopoda; Meissner
G. paniculata; Meissner
G. biternata; Meissner
G. triloba; Meissner
G. amplexans; F. v. M.
G. vestita; Meissner
G. tridentifera; Meissner
G. erinacea; Meissner

HAKEA; Schrader

H. Cunninghamii; Brown
H. suberea; S. Moore
H. lorea; Brown
H. macrocarpa; Cunningham
H. cyclocarpa; Lindley
H. crassifolia; Meissner
H. Brooksiana; F. v. M.
H. pandanocarpa; Brown
H. Roei; Bentham
H. adnata; Brown
H. obliqua; Brown
H. Hookeriana; Meissner
H. incrassata; Brown
H. flabellifolia; Meissner
H. Brownii; Meissner
H. Baxteri; Brown
H. ceratophylla; Brown
H. lasiantha; Brown
H. megalosperma; Meissner
H. clavata; Labillardiere
H. orthorrhyncha; F. v. M.
H. Candolleana; Meissner
H. trifurcata; Brown
H. erinacea; Meissner
H. platysperma; Hooker
H. brachyptera; Meissner
H. Kippistiana; Meissner
H. Preissii; Meissner
H. amplexicaulis; Brown
H. glabella; Brown
H. auriculata; Meissner
H. cristata; Brown
H. linearis; Brown
H. stenocarpoides; F. v. M.
H. ruscifolia; Labillardiere
H. verrucosa; F. v. M.
H. purpurea; Hooker
H. recurva; Meissner
H. circumalata; Meissner
H. commutata; F. v. M.
H. strumosa; Meissner
H. multilineata; Meissner
H. laurina; Brown
H. obtusa; Meissner
H. cinerea; Brown
H. corymbosa; Brown
H. undulata; Brown
H. petiolaris; Meissner
H. neurophylla; Meissner
H. loranthifolia; Meissner
H. cucullata; Brown
H. ferruginea; Sweet
H. smilacifolia; Meissner
H. elliptica; Brown
H. ambigua; Meissner
H. falcata; Brown
H. pycnoneura; Meissner
H. stenocarpa; Brown
H. marginata; Brown
H. myrtoides; Meissner
H. costata; Meissner
H. oleifolia; Brown
H. florida; Brown
H. varia; Brown
H. sulcata; Brown
H. Meissneriana; Kippist
H. subsulcata; Meissner
H. Lehmanniana; Meissner
H. nitida; Brown

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

H. Oldfieldii; Bentham
H. suaveolens; Brown
H. lissocarpha; Brown
H. bipinnatifida; Brown

BANKSIA; Linne

B. pulchella; Brown
B. Meissneri; Lehmann
B. nutans; Brown
B. sphaerocarpa; Brown
B. tricuspis; Meissner
B. occidentalis; Brown
B. litoralis; Brown
B. Elderiana; F. v. M. & Tate
B. verticillata; Brown
B. dryandroides; Baxter
B. Brownii; Baxter
B. attenuata; Brown
B. media; Brown
B. Solandri; Brown
B. Goodii; Brown
B. petiolaris; F. v. M.
B. repens; Labillardiere
B. prostrata; Brown
B. grandis; Willdenow
B. quercifolia; Brown
B. Baueri; Brown
B. coccinea; Brown
B. Sceptrum; Meissner
B. Menziesii; Brown
B. laevigata; Meissner
B. Hookeriana; Meissner
B. prionotes; Lindley
B. Victoriae; Meissner
B. speciosa; Brown
B. Baxteri; Brown
B. praemorsa; Andrews
B. Lehmanniana; Meissner
B. Caleyi; Brown
B. Lindleyana; Meissner
B. elegans; Meissner
B. Candolleana; Meissner
B. ilicifolia; Brown

DRYANDRA; Brown

D. quercifolia; Meissner
D. praemorsa; Meissner
D. cuneata; Brown
D. falcata; Brown
D. armata; Brown
D. longifolia; Brown
D. Fraseri; Brown
D. floribunda; Brown
D. carduacea; Lindley
D. carlinoides; Meissner
D. polycephala; Bentham
D. Kippistiana; Meissner
D. squarrosa; Brown
D. Serra; Brown
D. concinna; Brown
D. foliolata; Brown
D. stupposa; Lindley
D. nobilis; Lindley
D. mucronulata; Brown
D. formosa; Brown
D. Baxteri; Brown
D. nivea; Brown
D. Arctotidis; Brown
D. nana; Meissner
D. Preissii; Meissner
D. sclerophylla; Meissner
D. pulchella; Meissner
D. plumosa; Brown
D. senecionifolia; Brown
D. vestita; Kippist
D. cirsioides; Meissner
D. Hewardiana; Meissner
D. patens; Bentham
D. conferta; Bentham
D. horrida; Meissner
D. serratuloides; Meissner
D. comosa; Meissner
D. Shuttleworthiana; Meissner
D. speciosa; Meissner
D. tridentata; Meissner
D. tenuifolia; Brown
D. proteoides; Lindley
D. runcinata; Meissner
D. obtusa; Brown
D. bipinnatifida; Brown
D. pteridifolia; Brown
D. calophylla; Brown

RUBICACEAE.—A. L. DE JUSSIEU.

OLDENLANDIA; Plumier

O. galioides; F. v. M.
O. elatinoides, F. v. M.
O. tiliaeacea; F. v. M.
O. pterospora; F. v. M.

GARDENIA; Ellis

G. Keartlandi; R. Tate

CANTHIUM; Lamarck

C. latifolium; F. v. M.
C. oleifolium; Hooker
C. suaveolens; S. Moore

OPERCULARIA; J. Gaertner

O. vaginata; Labillardiere
O. spermacoces; Labillardiere
O. scabrida; Schlechtendal
O. hirsuta; F. v. M.
O. rubioides; A. L. de Jussieu
O. volubilis; Brown
O. hispidula, Endlicher
O. echinocephala; Bentham
O. apiciflora; Labillardiere

POMAX; Solander

P. umbellata; Solander

ELEUTHRANTHES; F. v. M.

E. opercularina; F. v. M.

GALIUM; Dodoens

G. Australe; De Candolle

CUCURBITACEAE.—HALLER

CUCUMIS; Tournefort

C. trigonus; Roxburgh
C. Chate; Linne

MELOTHRIA; Linne

M. Muelleri; Bentham
M. maderaspatana; Cogniaux

COMPOSITAE.—VAILLANT.

LAGENOPHORA; Cassini

L. Billardieri; Cassini
L. Huegelii; Bentham

BRACHYCOME; Cassini

B. goniocarpa; Sonder & F. v. M.
B. pachyptera; Turczaninow
B. iberidifolia; Bentham
B. pusilla; Steetz
B. Muelleri; Sonder
B. graminea; F. v. M.
B. Billardieri; Bentham
B. cheilocarpa; F. v. M.
B. ciliaris; Lessing
B. latisquamea; F. v. M.
B. glandulosa; Bentham
B. collina; Bentham

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

MINTURNIA; De Candolle

M. leptophylla; De Candolle
M. Cunninghamii; Bentham
M. sanctifolia; F. v. M.

CALOTIS; Brown

C. cymbacantha; F. v. M.
C. crinacea; Steetz
C. lappulacea; Bentham
C. plumulifera; F. v. M.
C. porphyroglossa; F. v. M.
C. hispidula; F. v. M.

ASTER; Tournefort

A. axillaris; F. v. M.
A. revolutus; F. v. M.
A. exilifolius; F. v. M.
A. Mitchelli; F. v. M.
A. exiguifolius; F. v. M.
A. Cassiniae; F. v. M.
A. pimeleoides; Cunningham
A. adenolasius; F. v. M.
A. calcareus; F. v. M.
A. Muelleri; Sonder
A. vernicosus; F. v. M.
A. Turczaninowii; F. v. M.
A. heleophilus; F. v. M.
A. muricatus; F. v. M.
A. Steetzii; F. v. M.
A. paucidentatus; F. v. M.
A. megalodontus; F. v. M.
A. homolepis; F. v. M.
A. exul; Lindley
A. picridifolius; F. v. M.
A. Huegelii; F. v. M.

VITTADINIA; Ach. Richard

V. Australis; A. Richard

PODOCOMA; Cassini

P. cuneifolia; Brown

PLUCHEA; Cassini

P. tetranthera; F. v. M.
P. conocephala; F. v. M.
P. Eyrea; F. v. M.
P. squarrosa; Bentham
P. dentex; Brown

PTERIGIRON; De Candolle

P. decurrens; De Candolle
P. lactroides; Bentham

EPALTES; Cassini

E. Tatei; F. v. M.

PTEROCAULON; Elliot

P. sphacelatus; Bentham & J. Hooker.

GNAPHALIUM; Linne

G. luteo album; Linne
G. Japonicum; Thunberg
G. indutum; J. Hooker

PODOSPERMA; Labillardiere

P. gnaphalioides; F. v. M.
P. angustifolium; Labillardiere
P. pygmaeum; F. v. M.
P. chrysanthum; F. v. M.
P. Polakii; F. v. M.

IXIOLAENA; Bentham

I. leptolepis; Bentham
I. tomentosa; Sonder & F. v. M.
I. viscosa; Bentham

PODOLEPIS; Labillardiere

P. canescens; Cunningham
P. aristata; Bentham
P. pallida; Turczaninow
P. nutans; Steetz
P. gracilis; Graham
P. rugata; Labillardiere
P. Lessoni; Bentham
P. Stuartii; F. v. M.
P. microcephala; Bentham
P. Kendalii; F. v. M.

ANTENNIA; Ker

A. Australis; Steetz
A. gracilis; Bentham
A. multiceps; Bentham
A. stricta; Bentham
A. tenella; Bentham
A. Croniniana; F. v. M.
A. chaetopoda; F. v. M.

LEPTORRHYNCHOS; Lessing

L. elongatus; De Candolle
L. medius; Cunningham

WAITZIA; Wendland

W. corymbosa; Wenland
W. aurea; Steetz
W. acuminata; Steetz
W. Steetziana; Lehmann
W. podolepis; Steetz
W. paniculata; F. v. M.

HELIPTERUM; De Candolle

H. Manglesii; F. v. M.
H. roseum; Bentham
H. fuscescens; Turczaninow
H. rubellum; Bentham
H. chlorocephalum; Bentham
H. microglossum; F. v. M.
H. floribundum; De Candolle
H. Pyrethrum; Bentham
H. heteranthum; Turczaninow
H. stipitatum; F. v. M.
H. Fitzgibboni; F. v. M.
H. Cotula; De Candolle
H. Battii; F. v. M.
H. hyalospermum; F. v. M.
H. condensatum; F. v. M.
H. Humboldtianum; De Candolle
H. Haigii; F. v. M.
H. tenellum; Turczaninow
H. strictum; Bentham
H. oppositifolium; S. Moore
H. sterilescens; F. v. M.
H. Troedeli; F. v. M.
H. pygmaeum; Bentham
H. Zacchaeus; S. Moore
H. verecundum; S. Moore
H. spicatum; F. v. M.
H. Jesseni; F. v. M.
H. Charsleyae; F. v. M.
H. pterochaetum; Bentham
H. Frenchii; F. v. M.
H. Forrestii; F. v. M.
H. polycephalum; Bentham
H. corymbosum; Bentham
H. laeve; Bentham
H. exiguum; F. v. M.
H. Dimorpholepis; Bentham

HELICHRYSUM; Vaillant

H. Cassinianum; Gaudichaud
H. Lawrencella; F. v. M.
H. subulifolium; F. v. M.
H. filifolium; F. v. M.
H. MacIvorii; F. v. M.
H. Ayersii; F. v. M.
H. oligochaetum; F. v. M.
H. Tepperi; F. v. M.
H. obtusifolium; Sonder & F. v. M.
H. luteolum; Henckel
H. leucopsidium; De Candolle

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

H. Gilesii; F. v. M.
H. ambiguum .; Turczaninow
H. apiculatum; De Candolle
H. puteale; S. Moore
H. semipapposum; De Candolle
H. Agyrozlottis: Bentham
H. ramosum; De Candolle
H. cordatum: De Candolle
H. Cassiope; S. Moore
H. adnatum; Bentham
H. lepidophyllum; F. v. M.

TYSONIA; F. v. M.

T. phyllostegia; F. v. M.

CASSINIA; Brown

C. arcuata; Brown

HUMEA; Smith

H. gracillima; F. v. M.

RUTIDOSIS; De Candolle

R. helichrysoides; De Candolle
R. Pumilo; Bentham

PITHOCARPA; Lindley

P. corymbosa; Lindley

MILLOTIA; Cassini

M. tenuifolia; Cassini
M. Kempei; F. v. M.

TOXANTHUS; Turczaninow

T. perpusillus; Turczaninow
T. Muelleri; Bentham
T. major; Turczaninow

QUINETIA; Cassini

Q. Urvillei; Cassini

DECAZESIA; F. v. M.

D. hecatocephala; F. v. M.

MYRIOCEPHALUS; Bentham

M. rhizocephalus; Bentham
M. nudus; A. Gray
M. appendiculatus; Bentham
M. Rudallii; F. v. M.
M. gracilis; Bentham
M. helichrysoides; A. Gray
M. suffruticosus; Bentham
M. Guerinae; F. v. M.

ANGIANTHUS; Wendland

A. humifusus; Bentham
A. tomentosus; Wendland
A. brachypappus; F. v. M.
A. myosuroides; Bentham
A. tenellus; Bentham
A. pusillus; Bentham
A. Milnei; Bentham
A. Cunninghamii; Bentham
A. phyllocephalus: Bentham
A. micropoides; Bentham
A. microcephalus; Bentham
A. Drummondii; Bentham
A. platycephalus; Bentham
A. Preissianus; Bentham
A. pygmaeus; Bentham
A. globifer; Bentham
A. demissus; Bentham
A. strictus; Bentham
A. plumiger; Bentham
A. amplexicaulis; Bentham

GNEPHOSIS; Cassini

G. Burkittii; Bentham
G. macrocephala; Turczaninow
G. skirrophora; Bentham
G. leptoclada; Bentham
G. intonsa; S. Moore
G. arachnoidea; Turczaninow
G. tenuissima; Cassini
G. acicularis; Bentham
G. pygmaea; Bentham
G. brevifolia; Bentham
G. eriocephala; Bentham

ERIOCHLAMYS; Sonder & F. v. M.

E. Behrii; Sonder & F. v.M.
E. Knappii; F. v. M.

CALOCEPHALUS; Brown

C. Drummondii; Bentham
C. Brownii; F. v. M.
C. Lessingi; F. v. M.
C. angianthoides; Bentham
C. Francisii; Bentham
C. multiflorus; Bentham
C. aeruoides; Bentham

CEPHALIPTERUM: A. Gray

C. Drummondii; A. Gray

GNAPHALODES; A. Gray

G. uliginosum; A. Gray
G. condensatum; A. Gray
G. filifolium; Bentham

CRASPEDIA; G. Forster

C. Richea; Cassini
C. pleiocephala; F. v. M.

CHTHONOCEPHALUS; Steetz

C. tomentellus; Bentham
C. Pseudevax; Steetz
C. pygmaeus; Bentham

SIEGESBECKIA; Linne

S. orientalis; Linne

FLAVERIA; A. L. de Jussieu

F. Australasica; Hooker

COTULA; Linne

C. filifolia; Thunberg
C. coronopifolia; Linne
C. Gymnogyne; F. v. M.
C. Australis; J. Hooker
C. Drummondii; Bentham

CENTIPEDA; Loureiro

C. orbicularis; Loureiro
C. Cunninghami; F. v. M.
C. thespidioides; F. v. M.

ELACHANTHUS; F. v. M.

E. pusillus; F. v. M.
E. occidentalis; S. Moore

CERATOGYNE; Turczaninow

C. obionoides; Turczaninow

ISOETOPSIS; Turczaninow

I. graminifolia; Turczaninow

SENECIO; Tournefort

S. Gregorii; F. v. M.
S. lautus; Solander
S. leucoglossus; F. v. M.
S. brachyglossus; F. v. M.
S. Georgianus; De Candolle
S. Gilberti; Turczaninow
S. ramosissimus; De Candolle
S. Cunninghamii; De Candolle

ERECHTITES; Rafinesque

E. arguta; De Candolle
E. picridioides; Turczaninow
E. quadridentata; De Candolle
E. hispidula; De Candolle

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

CYMBONOTUS: Cassini

C. Lawsianus: Gandichaud

TRICHOCLINE: Cassini

T. sagittata: Bentham & J. Hooker

MICROSERIS: D. Don

M. Forsteri: J. Hooker

CAMPANULACEÆ—A. L. DE JUSSIEU

LOBELIA: Linné

L. heterophylla: Labillardière
L. macrosperma: F. v. M.
L. Toppii: Luehmann
L. rhynchosperma: Bentham
L. tenuior: Brown
L. rhombifolia: De Vriese
L. parvifolia: Brown
L. Bergmana: Cassasso
L. access: Thunberg
L. humistrata: F. v. M.

ISOTOMA: Brown

I. Brownii: G. Don
I. petræa: F. v. M.
I. pusilla: Bentham
I. scapigera: G. Don

WAHLENBERGIA: Schrader

W. gracilis: A. De Candolle

CANDOLLEACEÆ—F. v. M.

CANDOLLEA: Labillardière

C. carnosa: F. v. M.
C. pinna: Labillardière
C. reduplicata: F. v. M.
C. scabrida: F. v. M.
C. hirsuta: F. v. M.
C. crassicephala: F. v. M.
C. juncea: F. v. M.
C. guttata: F. v. M.
C. repens: F. v. M.
C. elongata: F. v. M.
C. spinosa: F. v. M.
C. limbata: F. v. M.
C. caespitosa: F. v. M.
C. squamellosa: F. v. M.
C. violacea: F. v. M.
C. lutea: F. v. M.
C. filifera: F. v. M.
C. ciliata: F. v. M.
C. disperma: F. v. M.
C. calcarata: F. v. M.
C. perpusilla: F. v. M.
C. assimilis: F. v. M.
C. rupestris: F. v. M.
C. spathulata: F. v. M.
C. Barleei: F. v. M.
C. lineata: F. v. M.
C. glauca: Labillardière
C. amoena: F. v. M.
C. striata: F. v. M.
C. diversifolia: F. v. M.
C. articulata: F. v. M.
C. Brunoniana: F. v. M.
C. diuroides: F. v. M.
C. scandens: F. v. M.
C. verticillata: F. v. M.
C. glandulosa: F. v. M.
C. Preissii: F. v. M.
C. imbricata: F. v. M.
C. adpressa: F. v. M.
C. despecta: F. v. M.
C. utricularioides: F. v. M.
C. pygmaea: F. v. M.
C. longituba: F. v. M.
C. brachyphylla: F. v. M.
C. pulchella: F. v. M.
C. petiolaris: F. v. M.
C. emarginata: F. v. M.
C. corymbosa: F. v. M.
C. lepida: F. v. M.
C. streptocarpa: F. v. M.
C. anadora: F. v. M.
C. crassifolia: F. v. M.
C. pycnostachya: F. v. M.
C. pubescens: F. v. M.
C. canaliculata: F. v. M.
C. cypsecioides: S. Moore
C. leptopoda: F. v. M.
C. dichotoma: F. v. M.
C. humifusa: F. v. M.
C. Merrallana: F. v. M.
C. brevicapa: F. v. M.
C. fasciculata: F. v. M.
C. falcata: F. v. M.
C. rhynchocarpa: F. v. M.
C. adscata: F. v. M.

LEREWENBERGIA: Brown.

L. pusilla: Brown
L. dubia: Sonder
L. patuliflora: Bentham
L. leptantha: Bentham
L. stipitata: F. v. M.
L. Preissii: F. v. M.

GOODENIACEÆ—Brown

BRUNONIA: Smith

B. Australis: Smith

DAMPIERA: Brown

D. luteiflora: F. v. M.
D. spicifera: Bentham
D. candicans: F. v. M.
D. teres: Lindley
D. trifoliata: De Vriese
D. prostrata: De Vriese
D. alata: Lindley
D. coronata: Lindley
D. carinata: Bentham
D. saccata: F. v. M.
D. incana: Brown
D. hederacea: Brown
D. alutacea: F. v. M.
D. rosmarinifolia: Schlechtendal
D. lavandulacea: Lindley
D. juncea: Bentham
D. oligophylla: Bentham
D. loranthifolia: F. v. M.
D. leptocalyx: Bentham
D. fasciculata: Brown
D. subsericata: Bentham
D. triloba: Lindley
D. linearis: Brown
D. cuneata: Brown
D. sericantha: F. v. M.
D. parvifolia: Brown
D. glabrescens: Bentham
D. diversifolia: De Vriese
D. eriocephala: De Vriese
D. Wellsiana: F. v. M.

DIASPASIS: Brown

D. filifolia: Brown

LESCHENAULTIA: Brown

L. formosa: Brown
L. oblata: Sweet
L. chlorantha: F. v. M.
L. linarioides: De Candolle
L. tubiflora: Brown
L. superba: F. v. M.
L. actinoloba: Bentham
L. laricina: Lindley
L. hirsuta: F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

L. longiloba; F. v. M.
L. biloba; Lindley
L. expansa; Brown
L. floribunda; Bentham
L. heteromera; Bentham

ANTHOTIUM; Brown

A. humile; Brown
A. rubriflorum; F. v. M.

CATOSPERMA; Bentham

C. Careyi; F. v. M.

SCAEVOLA; Linne

S. spinescens; Brown
S. Groeneri; F. v. M.
S. tomentosa; Gaudichaud
S. atriplicina; F. v. M.
S. striata; Brown
S. phlebopetala; F. v. M.
S. pilosa; Bentham
S. parvifolia; F. v. M.
S. oxyclona; F. v. M.
S. restiacea; Bentham
S. tortuosa; Bentham
S. Brooksiana: F. v. M.
S. nitida; Brown
S. globuliflora; Labillardiere
S. porocarya; F. v. M.
S. attenuata; Brown
S. glandulifera; De Candolle
S. anchusifolia; Bentham
S. holosericea; De Vriese
S. crassifolia; Labillardiere
S. longifolia; De Vriese
S. lanceolata; Bentham
S. thesioides; Bentham
S. macrophylla; Bentham
S. platyphylla; Lindley
S. auriculata; Bentham
S. ovalifolia; Brown
S. aemula; Brown
S. microphylla; Bentham
S. cuneiformis; Labillardiere
S. Oldfeldii; F. v. M.
S. paludosa; Brown
S. sericophylla; F. v. M.
S. canescens; Bentham
S. humifusa; De Vriese
S. fasciculata; Bentham
S. stenophylla; Bentham
S. Reinwardtii; De Vriese
S. Verreauxii; F. v. M.

SELLIERA; Cavanilles

S. exigua; F. v. M.

CALOGYNE; Brown

C. Berardiana; F. v. M.

GOODENIA; Smith

G. phylicoides; F. v. M.
G. viscida; Brown
G. xanthotricha; De Vriese
G. scapigera; Brown
G. quadrilocularis; Brown
G. Ramelii; F. v. M.
G. pinifolia; De Vriese
G. Elderi; F. v. M. & Tate
G. Watsonii; F. v. M. & Tate
G. varia; Brown
G. strophiolata; F. v. M.
G. laevis; Bentham
G. Kintorei; F. v. M. & Tate
G. arthrotricha; F. v. M.
G. geniculata; Brown
G. hederacea; Smith
G. xanthosperma; F. v. M
G. incana; Brown
G. leptoclada; Bentham
G. Eatoniana; F. v. M.
G. coerulea; Brown
G. trichophylla; De Vriese
G. Hassallii; F. v. M.
G. pterygosperma; Brown
G. Bonneyana; F. v. M.
G. grandiflora; Sims
G. Mueckeana; F. v. M.
G. heterochila; F. v. M.
G. corynocarpa; F. v. M.
G. cycloptera; Brown
G. tenella; Brown
G. pinnatifida; Schlechtendal
G. mimuloides; S. Moore
G. tenuiloba; F. v. M.
G. Forrestii; F. v. M.
G. concinna; Bentham
G. glauca; F. v. M.
G. filiformis; Brown
G. microptera; F. v. M.
G. lamprosperma; F. v. M.
G. claytoniacea; F. v. M.

VELLEYA; Smith

V. Daviesii; F. v. M.
V. connata; F. v. M.
V. discophora: F. v. M.
V. trinervis; Labillardiere
V. macrophylla: Bentham
V. cycnopotamica; F. v. M.
V. paradoxa; Brown
V. rosea; S. Moore
V. macrolpectra; F. v. M.
V. Cusackiana; F. v. M.
V. Salmoniana; F. v. M.

SYNPETALEAE HYPOGYNAE.—F. v. M

GENTIANEAE.—NECKER.

LIMNANTHEMUM; Gmelin

L. parnassifolium; F. v. M.
L. violifolium; F. v. M.
L. lasiospernum; F. v. M.
L. albiflorum; F. v. M.
L. latifolium; F. v. M.
L. calthifolium; F. v. M.
L. congestiflorum; F. v. M.
L. capitatum; F. v. M.

SEBAEA; Solander

S. ovata; Brown

ERYTHRAEA; Reneaulme

E. spicata; Persoon

LOGANIACEAE.—BROWN.

STRYCHNOS; Linne

S. lucida; Brown

MITRASACME; Labillardiere

M. paradoxa; Brown

LOGANIA; Brown

L. longifolia; Brown
L. latifolia; Brown
L. crassifolia; Brown
L. ovata; Brown
L. buxifolia; F. v. M.
L. stenophylla; F. v. M.
L. micrantha; Bentham
L. fasciculata: Brown
L. nuda; F. v. M.
L. spermacocea; F. v. M.
L. flaviflora; F. v. M.
L. callosa; F. v. M.
L. campanulata; Brown
L. serpillifolia; Brown
L. choretroides; F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

PLANTAGINEAE.—A. L. DE JUSSIEU.

PLANTAGO; Tournefort

P. varia; Brown

PRIMULACEAE.—VENTENAT.

SAMOLUS; Tournefort

S. repens; Persoon

JASMINEAE.—A. L. DE JUSSIEU.

JASMINUM; Tournefort

J. linearе; Brown
J. calcareum; F. v. M.

APOCYNEAE.—A. L. DE JUSSIEU.

ALYXIA; Banks

A. buxifolia; Brown

WRIGHTIA; Brown

W. Cunninghamii; Bentham

LYONSIA; Brown

I. diaphanophleba; F. v. M.

ASCLEPIADEAE.—N. J. JACQUIN

CYNANCHUM; Linne

C. floribundum; Brown

SARCOSTEMMA; Brown

S. Australe; Brown

DAEMIA; Brown

D. linearis; F. v. M.
D. Kempeana; F. v. M.

MARSDENIA; Brown

M. Leichhardtiana; F. v. M.

CONVOLVULACEAE.—A. L. DE JUSSIEU.

IPOMOEA; Linne

I. costata; F. v. M.
I. Pes Caprae; Roth
I. aquatica; Forskael
I. Muelleri; Bentham

CONVOLVULUS; Tournefort

C. erubescens; Sims
C. sepium; Linne

POLYMERIA; Brown

P. occidentalis; F. v. M.
P. ambigua; Brown

PORANA; Burmann

P. sericea; F. v. M.

BREWERIA; Brown

B. rosea; F. v. M.

EVOLVULUS; Linne

E. linifolius; Linne

DICHONDRA; R. & G. Forster

D. repens; R. & G. Forster

CRESSA; Linne

C. Cretica; Linne

WILSONIA; Brown

W. humilis; Brown
W. rotundifolia; Hooker
W. Backhousi; J. Hooker

CUSCUTA; Tournefort

C. Australis; Brown

SOLANACEAE.—HALLER.

SOLANUM; Tournefort

S. nigrum; Linne
S. simile; F. v. M.
S. fasciculatum; F. v. M.
S. ferocissimum; Lindley
S. orbiculatum; Dunal
S. nummularium; S. Moore
S. oligacanthum; F. v. M.
S. esuriale; Lindley
S. chenopodinum; F. v. M.
S. Sturtianum; F. v. M.
S. Oldfieldii; F. v. M.
S. Hystrix; Brown
S. eremophilum; F. v. M.
S. echinatum; Brown
S. lasiophyllum; Dunal
S. ellipticum; Brown
S. phlomoides; Cunningham
S. Lucani; F. v. M.

LYCIUM; Linne

L. Australe; F. v. M.

DATURA; Linne

D. Leichhardtii; F. v. M.

NICOTIANA; Tournefort

N. suaveolens; Lehmann

ANTHOTROCHE; Endlicher

A. pannosa; Endlicher
A. Blackii; F. v. M.
A. Healiana; F. v. M.
A. Walcottii; F. v. M.

ANTHOCERCIS; Labillardiere

A. viscosa; Brown
A. litorea; Labillardiere
A. gracilis; Bentham
A. genistoides; Miers
A. anisantha; Endlicher
A. intricata; F. v. M.
A. arborea; F. v. M.
A. fasciculata; F. v. M.
A. microphylla; F. v. M.
A. racemosa; F. v. M.

ISANDRA; F. v. M.

I. Bancroftii; F. v. M.

DUBOISIA; Brown

D. Hopwoodii; F. v. M.

SCROPHULARINAE.—MIRBEL.

MIMULUS; Linne

M. gracilis; Brown
M. repens; Brown

STEMODIA; Linne

S. grossa; Bentham
S. viscosa; Roxburgh
S. linophylla; F. v. M.
S. pedicellaris; F. v. M.
S. Morgania; F. v. M.
S. Kingii; F. v. M.

GRATIOLA; Ruppius

G. pedunculata; Brown
G. Peruviana; Linne

LINDERNIA; Allich

L. pyxidaria; Linne

PEPLIDIUM; Delile

P. humifusum; Delile
P. Muelleri; Bentham

GLOSSOSTIGMA; Arnott

G. Drummondii; Bentham
G. trichodes; F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

LIMOSELLA; Lindern
L. aquatica: Linne

VERONICA; Tournefort
V. distans; Brown
V. calycina; Brown
V. peregrina; Linne

BUCHNERA; Linne
B. parviflora; Brown

EUPHRASIA; Tournefort
E. Brownii; F. v. M.
E. scabra; Brown

OROBANCHEAE.—A. L. DE JUSSIEU

OROBANCHE; Tournefort
O. Australiana; F. v. M.

LENTIBULARINAE.—L. C. RICHARD.

UTRICULARIA; Linne
U. flexuosa; Vahl
U. simplex; Brown
U. volubilis; Brown
U. Hookeri; Lehmann
U. violacea; Brown
U. Menziesii; Brown

POLYPOMPHOLYX; Lehmann
P. multifida; F. v. M.
P. tenella; Lehmann

BIGNONIACEAE.—VENTENAT.

TECOMA; A. L. de Jussieu
T. Australis; Brown

DOLICHANDRONE; Fenzl
D. heterophylla; F. v. M.

PEDALINAE.—BROWN.

JOSEPHINIA; Ventenat
J. Eugeniae; F. v. M.

ACANTHACEAE.—A. L. DE JUSSIEU

JUSTICIA; Houston
J. procumbens; Linne
J. Kempeana; F. v. M.

DICLADANTHERA; F. v. M.
D. Forrestii; F. v. M.

LABIATAE.—ADANSON.

MENTHA; Tournefort
M. saturejoides; Brown

PROSTANTHERA; Labillardiere
P. Wilkieana; F. v. M.
P. Baxteri; Cunningham
P. Campbelli; F. v. M.
P. canaliculata; F. v. M.
P. striatiflora; F. v. M.
P. Eckersleyana; F. v. M.
P. Tysoni; F. v. M.
P. coccinea; F. v. M.
P. Grylloana; F. v. M.

WRIXONIA; F. v. M.
W. prostantheroides; F. v. M.

HEMIGENIA; Brown
H. Macphersoni; Luehmann
H. macrantha; F. v. M.
H. rigida; Bentham
H. Pritzel; S. Moore
H. ramosissima; Bentham
H. *microphylla*; Bentham
H. incana; Bentham
H. canescens; Bentham
H. podalyrina; F. v. M.
H. platyphylla; Bentham
H. obovata; F. v. M.
H. glabrescens; Bentham
H. obtusa; Bentham
H. sericea; Bentham
H. barbata; Bartling
H. curvifolia; F. v. M.
H. Tysoni; F. v. M.
H. exilis; S. Moore
H. scabra; Bentham
H. humilis; Bentham
H. westringioides; Bentham
H. teretiuscula; F. v. M.
H. brachyphylla; F. v. M.
H. Drummondii; Bentham
H. pimelifolia; F. v. M.
H. diplanthera; F. v. M.
H. pungens; F. v. M.
H. leiantha; F. v. M.
H. loganiacea; F. v. M.

MICROCORYS; Brown
M. longifolia; Bentham
M. longiflora; F. v. M.
M. tenuifolia; Bentham
M. capitata; Bentham
M. pimeloides; F. v. M.
M. subcanescens; Bentham
M. ericifolia; Bentham
M. glabra; Bentham
M. exserta; Bentham
M. virgata; Brown
M. Macrediana; F. v. M.
M. barbata; Brown
M. lenticularis; F. v. M.
M. obovata; Bentham
M. purpurea; Brown

WESTRINGIA; Smith
W. cephalantha; F. v. M.
W. Dampieri; Brown
W. rigida; Brown

TEUCRIUM; Tournefort
T. sessiliflorum; Bentham
T. filiobum; F. v. M.
T. racemosum; Brown
T. grandiusculum; F. v. M. & Tate

VERBENACEAE.—ADANSON.

SPARTOTHAMNUS; Cunningham
S. teucriflorus; F. v. M.

LIPPIA; Houston
L. nodiflora; Cl. Richard

LACHNOSTACHYS; Hooker
L. albicans; Hooker
L. Cliftoni; F. v. M.
L. verbascifolia; F. v. M.
L. ferruginea; Hooker
L. Walcottii; F. v. M.

NEWCASTLIA; F. v. M.
N. cladotricha; F. v. M.
N. bracteosa; F. v. M.
N. chrysotricha; F. v. M.
N. hexarrhena; F. v. M.
N. spodiotricha; F. v. M.
N. cephalantha; F. v. M.

PHYSOPSIS; Turczaninow
P. spicata; Turczaninow

MALLOPHORA; Endlicher
M. globiflora; Endlicher

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

DICHANTHES; Drummond and Harvey
D. ochrotricha; F. v. M.
D. fulva; Drummond & Harvey
D. reticulata; Drummond & Harvey
D. Nicholasii; F. v. M.
D. parvifolia; F. v. M.
D. Stoechas; Drummond & Harvey
D. Carnegiei; W. B. Hemsley

CHLOANTHES; Brown
C. coccinea; Bartling
C. hemigenioides; F. v. M.
C. uncinata; Turczaninow
C. Bartlingii; Lehmann
C. verbascina; F. v. M
C. stachyodes; F. v. M.
C. loxocarpa; F. v. M.
C. dilatata; F. v. M.
C. cuneata; F. v. M.
C. Oldfieldii; F. v. M.
C. striplicina; F. v. M.
C. paniculata; F. v. M.
C. coerulea; F. v. M.
C. lepidota; F. v. M.
C. loricata; F. v. M.
C. halganiacea, F. v. M.
C. Teckiana; F. v. M.
C. Depremesnillii; Depremesnilia chrysocalyx, F. v. M.

HEMIPHORA; F. v. M.
H. Elderi; F. v. M.

CYANOSTEGIA; Turczaninow
C. Turczaninowii; F. v. M.

CLERODENDRUM; Burmann
C. lanceolatum; F. v. M.

AVICENNIA; Linne
A. officinalis; Linne

MYOPORINAE.—BROWN.

EREMOPHILA; Brown
E. Mackinlayi; F. v. M.
E. strongylophylla; F. v. M.
E. leucophylla; Bentham
E. Forrestii; F. v. M.
E. eriocalyx; F. v. M.
E. Maitlandi; F. v. M.
E. Margarethæ; S. Moore
E. punicea; S. Moore
E. oppositifolia; Brown
E. Paisleyi; F. v. M.
E. exilifolia; F. v. M.
E. metallicorum; S. Moore
E. Dempsteri; F. v. M.
E. Gibsoni; F. v. M.
E. Berryi; F. v. M.
E. Phillipsii; F. v. M.
E. Clarkei; F. v. M.
E. Gilesii; F. v. M.
E. Latrobei; F. v. M.
E. gracilliflora; F. v. M.
E. Tietkensii; F. v. M.
E. longifolia; F. v. M.
E. Laanii; F. v. M.
E. Drummondii,; F. v. M.
E. Hughesii; F. v. M.
E. Freelingii; F. v. M.
E. Fraseri; F. v. M.
E. Goodwinii; F. v. M.
E. Elderi; F. v. M.
E. Battii; F. v. M.
E. Willsii; F. v. M.
E. granitica; S. Moore
E. platycalyx; F. v. M.
E. viscida; Endlicher
E. Brownii; F. v. M.
E. subfloccosa; Bentham
E. Oldfieldii; F. v. M.
E. maculata; F. v. M.
E. denticulata; F. v. M.
E. latifolia; F. v. M.
E. alternifolia; Brown
E. interstans; S. Moore
E. Dalyana; F. v. M.
E. Pantoni; F. v. M.
E. saligna; S. Moore
E. scoparia; F. v. M.
E. Delisserii; F. v. M.
E. crassifolia; F. v. M.
E. resinosa; F. v. M.
E. Woollsiana; F. v. M.
E. brevifolia; F. v. M.
E. Weldii; F. v. M.
E. densifolia; F. v. M
E. gibbosifolia; F. v. M.
E. homoplastica; S. Moore
E. coerulea; S. Moore
E. Veronica; S. Moore
E. microtheca; F. v. M
E. adenotricha; F. v. M.
E. Youngii; F. v. M.

MYOPORUM; Banks & Solander.
M. Dampieri; Cunningham
M. deserti; Cunningham
M. insulare; Brown
M. serratum; Brown
M. oppositifolium; Brown
M. humile; Brown
M. platycarpum; Brown
M. Beckeri; F. v. M.
M. salsoloides; Turczaninow

ASPERIFOLIAE.—HALLER.

CYNOGLOSSUM; Tournefort.
C. Drummondii; Bentham

LAPPULA; Rivinus.
L. concava; F. v. M.

ERITRICHUM; Schrader.
E. Australasicum; A. de Candolle

MYOSOTIS; Rupplus
M. Australis; Brown

POLLICHIA; Medikus
P. Zeylanica; F. v. M.

HALGANIA; Gaudichaud
H. solanacea; F. v. M.
H. litoralis; Gaudichaud
H. corymbosa; Lindley
H. sericiflora; Bentham
H. cyanea; Lindley
H. viscosa; S. Moore
H. lavandulacea; Endlicher
H. rigida; S. Moore
H. integerrima; Endlicher

HELIOTROPIUM; Tournefort
H. Curassavicum; Linne
H. Europæum; Linne
H. undulatum; Vahl
H. asperrimum; Brown
H. ovalifolium; Forskael
H. heteranthum; F. v. M.
H. filaginoides; Bentham
H. tenuifolium; S. Moore
H. paniculatum; Brown

EPACRIDEAE.—BROWN.

STYPHELIA; Solander
S. Hainesii; F. v. M.
S. tenuiflora; Lindley

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

S. melaleucoides; F. v. M.
S. Leucopogon; F. v. M.
S. lasionema; F. v. M.
S. macrocalyx; F. v. M.
S. Kingiana; F. v. M.
S. xerophylla; F. v. M.
S. pentapogonea; F. v. M.
S. prostrata; F. v. M.
S. tecta; Sprengel
S. Candolleana; F. v. M.
S. microdonta; F. v. M.
S. pallida; Sprengel
S. compacta; Sprengel
S. humifusa; Persoon
S. Epacridis; F. v. M.
S. Drummondii; F. v. M.
S. microcalyx; F. v. M.
S. Baxteri; F. v. M.
S. longiflora; F. v. M.
S. verticillata; Sprengel
S. interrupta; Sprengel
S. alternifolia; Sprengel
S. Richei; Labillardiere
S. Australis; F. v. M.
S. capitellata; F. v. M.
S. revoluta; Sprengel
S. grandiuscula; F. v. M.
S. reflexa; Sprengel
S. corifolia; F. v. M.
S. distans; Sprengel
S. gibbosa; F. v. M.
S. cordata; F. v. M.
S. Bossiaea; F. v. M.
S. hirsuta; F. v. M.
S. compacta; F. v. M.
S. squarrosa; F. v. M.
S. tetragona; F. v. M.
S. phyllostachys; F. v. M.
S. glabella; Sprengel
S. semiopposita; F. v. M.
S. florulenta; F. v. M.
S. striata; Sprengel
S. lasiostachya; F. v. M.
S. carinata; Sprengel
S. opponens; F. v. M.
S. oppositifolia; F. v. M.
S. tamariscina; Sprengel
S. bracteolaris; F. v. M.
S. blepharophylla; F. v. M.
S. tenuis; F. v. M.
S. gnaphalioides; F. v. M.
S. Gilbertii; F. v. M.
S. gracilis; Sprengel
S. acicularis; F. v. M.
S. cryptantha; F. v. M.
S. gracillima; F. v. M.
S. cymbiformis; F. v. M.
S. apiculata; Sprengel
S. polystachya; Sprengel
S. pulchella; F. v. M.
S. polymorpha; F. v. M.
S. assimilis; F. v. M.
S. Oldfieldii; F. v. M.
S. cucullata; Sprengel
S. sprengelioides; F. v. M.
S. obtusata; F. v. M.
S. fimbriata; F. v. M.
S. ozothamnoides; F. v. M.
S. plumiflora; F. v. M.
S. unilateralis; F. v. M.
S. pleurandroides; F. v. M.
S. rubicunda; F. v. M.
S. brevicuspis; F. v. M.
S. propinqua; Sprengel
S. subulifolia; F. v. M.
S. Allittii; F. v. M.
S. racemulosa; F. v. M.
S. pendula; Sprengel
S. concinna; F. v. M.
S. flavescens; F. v. M.
S. blepharolepis; F. v. M.
S. rotundifolia; Sprengel
S. cordifolia; F. v. M.
S. megacarpa; F. v. M.
S. erubescens; F. v. M.
S. lissantholdes; F. v. M.
S. stricta; F. v. M.
S. conostephioides; F. v. M.
S. pogonocalyx; F. v. M.
S. breviflora; F. v. M.
S. dura; F. v. M.
S. multiflora; Sprengel
S. obtecta; F. v. M.
S. crassifolia; F. v. M.
S. strongylophylla; F. v. M.
S. crassiflora; F. v. M.
S. corynocarpa; F. v. M.
S. Woodsii; F. v. M.
S. leptantha; F. v. M.
S. patula; Sprengel
S. ovalifolia; Sprengel
S. ramiflora; Sprengel
S. depressa; Sprengel
S. oligarrhenoides; F. v. M.
S. minutiflora; F. v. M.

OLIGARRHENA; Brown

O. micrantha; Brown

NEEDHAMIA; Brown

N. pumilio; Brown

BRACHYLOMA; Sonder

B. Preissii; Sonder
B. concolor; F. v. M.

CONOSTEPHIUM; Bentham

C. pendulum; Bentham
C. minus; Lindley
C. Roei; Bentham
C. Preissii; Sonder
C. planifolium; F. v. M.

COLEANTHERA; Stachegleew

C. coelophylla; Bentham
C. myrtoides; Stschegleew
C. virgata; Stachegleew

TROCHOCARPA; Brown

T. parviflora; Bentham

LYSINEMA; Brown

L. lasianthum; Brown
L. conspicuum; Brown
L. ciliatum; Brown
L. fimbriatum; F. v. M.
L. elegans; Sonder

COSMELIA; Brown

C. rubra; Brown

ANDERSONIA; Brown

A. colossea; F. v. M.
A. patricia; F. v. M.
A. grandiflora; Stschegleew
A. setifolia; Bentham
A. involucrata; Sonder
A. homalostoma; Bentham
A. sprengelioides; Brown
A. latiflora; F. v. M.
A. gracilis; De Candolle
A. aristata; Lindley
A. macronema; F. v. M.
A. parvifolia; Brown
A. depressa; Brown
A. coerulea; Brown
A. subulata; Bentham

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

A. heterophylla; Sonder
A. brachyanthera; F. v. M.
A. brevifolia; Sonder
A. variegata; Sonder
A. micrantha; Brown

SPHENOTOMA; Sweet

S. squarrosum; G. Don
S. Drummondii; F. v. M.
S. dracophylloides; Sonder
S. capitatum; Lindley
S. gracile; Sweet
S. parviflorum; F. v. M.

APETALEAE GYMNOSPERMAE.—F. v. M.

CONIFERAE.—HALLER.

CALLITRIS; Ventenat

C. Roei; Bentham & J. Hooker
C. Drummondii; Bentham & J. Hooker
C. verrucosa; Brown
C. Actinostrobus; F. v. M.
C. acuminata; F. v. M.

NAGEIA; Gaertner

N. Drouyniana; F. v. M.

CYCADEAE.—L. C. RICHARD.

ENCEPHALARTOS; Lehmann.

E. Fraseri; Miquel
E. Dyeri; F. v. M.

MONOCOTYLEDONEAE.—Ray.

Eucalycoae Perigynae—F. v. M.

ORCHIDEAE.—HALLER.

GASTRODIA; Brown

G. sesamoides; Brown

THELYMITRA; R. & G. Forster

T. ixioides; Swartz
T. crinita; Lindley
T. aristata; Lindley
T. longifolia; R. & G. Forster
T. villosa; Lindley
T. tigrina; Brown
T. fusco-lutea; Brown
T. stellata; Lindley
T. flexuosa; Endlicher
T. antennifera; J. Hooker
T. Mackibbinii; F. v. M.
T. variegata; Lindley
T. mucida; Fitzgerald

EPIBLEMA; Brown

E. grandiflorum; Brown

DIURIS; Smith

D. setacea; Brown
D. emarginata; Brown
D. longifolia; Brown
D. pauciflora; Brown

CALOCHILUS; Brown

C. Robertsoni; Bentham

CRYPTOSTYLIS; Brown

C. ovata; Brown

PRASOPHYLLUM; Brown

P. elatum; Brown
P. hians; G. Reichenbach
P. cyphochilum; Bentham
P. ovale; Lindley
P. macrostachyum; Brown
P. Reichenbachii; F. v. M.
P. parvifolium; Lindley
P. gibbosum; Brown
P. cucullatum; G. Reichenbach

MICROTIS; Brown

M. porrifolia; Brown
M. media; Brown
M. alba; Brown
M. pulchella; Brown
M. atrata; Lindley

CORYSANTHES; Brown

C. pruinosa; R. Cunningham

PTEROSTYLIS; Brown

P. nana; Brown
P. reflexa; Brown
P. recurva; Bentham
P. barbata; Lindley
P. rufa; Brown
P. vittata; Lindley

CALEYA; Brown

C. nigrita; Lindley

DRAKAEA; Lindley

D. ciliata; G. Reichenbach
D. elastica; Lindley

ACIANTHUS; Brown

A. exsertus; Brown

CYRTOSTYLIS; Brown

C. reniformis; Brown

LYPERANTHUS; Brown

L. nigricans; Brown
L. Forrestii; F. v. M.

ERIOCHILUS; Brown

E. scaber; Lindley
E. tenuis; Lindley
E. dilatatus; Lindley
E. multiflorus; Lindley
E. fimbriatus; F. v. M.

CALADENIA; Brown

C. Menziesii; Brown
C. Cairnsiana; F. v. M.
C. multiclavia; G. Reichenbach
C. discoidea; Lindley
C. Patersoni; Brown
C. Drummondii; Bentham
C. hirta; Lindley
C. Roei; Bentham
C. Barbarossae; G. Reichenbach
C. flava; Brown
C. latifolia; Brown
C. reptans; Lindley
C. serrata; G. Reichenbach
C. aphylla; Bentham
C. sericea; Lindley
C. gemmata; Lindley
C. ixioides; Lindley
C. unita; Fitzgerald

GLOSSODIA; Brown

G. Brunonis; Endlicher
G. intermedia; Fitzgerald
G. emarginata; Lindley

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

IRIDEAE.—VENTENAT

PATERSONIA; Brown

P. occidentalis; Brown
P. umbrosa; Endlicher
P. xanthina; F. v. M.
P. limbata; Endlicher
P. juncea; Lindley
P. Maxwelli; F. v. M.
P. pygmaea; Lindley
P. lanata; Brown
P. rudis; Endlicher
P. macrantha; Bentham
P. Drummondii; F. v. M.
P. inaequalis; Bentham
P. graminea; Bentham
P. babianoides; Bentham

SISYRINCHIUM; Linne

S. cyaneum; Lindley
S. polystachyum; F. v. M.

HYDROCHARIDEAE.—LAMARCK & DE CANDOLLE.

OTTELIA; Persoon

O. ovalifolia; L. C. Richard

VALLISNERIA; Micheli;

V. spiralis; Linne

HAEMODORACEAE.—BROWN

HAEMODORUM; Smith.

H. sparsiflorum; F. v. M.
H. spicatum; Brown
H. brevisepaleum; Bentham
H. paniculatum; Lindley
H. laxum; Brown
H. simplex; Lindley
H. simulans; F. v. M.

PILEBOCARYA; Brown

P. ciliata; Brown
P. pilosissima; F. v. M.
P. filifolia; F. v. M.

TRIBONANTHES; Endlicher

T. brachypetala; Lindley
T. uniflora; Lindley
T. Australis; Endlicher
T. variabilis; Lindley
T. longipetala; Lindley

CONOSTYLIS; Brown

C. breviscapa; Brown
C. vaginata; Endlicher
C. petrophiloides; F. v. M.
C. setosa; Lindley
C. aurea; Lindley
C. melanopogon; Endlicher
C. setigera; Brown
C. Psyllium; Endlicher
C. villosa; Bentham
C. Drummondii; Bentham
C. involucrata; Endlicher
C. gladiata; Bentham
C. scorsiflora; F. v. M.
C. teretiuscula; F. v. M.
C. stylidioides; F. v. M.
C. prolifera; Bentham
C. racemosa; Bentham
C. candicans; Endlicher
C. dealbata; Lindley
C. Preissii; Endlicher
C. bracteata; Endlicher
C. filifolia; F. v. M.
C. spinuligera; F. v. M.
C. bromeliodes; Endlicher
C. aculeata; Brown
C. laxiflora; Bentham
C. cymosa; F. v. M.
C. serrulata; Brown
C. caricina; Lindley
C. Androstemma; F. v. M.
C. Beallana; F. v. M.
C. canescens; F. v. M.

ANIGOZANTHOS; Labillardiere

A. rufa; Labillardiere
A. pulcherrima; Hooker
A. flavida; Redoute et De Candolle
A. Preissii; Endlicher
A. humilis; Lindley
A. viridis; Endlicher
A. Manglesii; D. Don
A. bicolor; Endlicher
A. fuliginosus; Hooker

AMARYLLIDEAE.—J. ST. HILLAIRE.

HYPOXIS; Linne

H. glabella; Brown
H. occidentalis; Bentham

CRINUM; Linne

C. flaccidum; Herbert

DIOSCORIDEAE.—DU MORTIER.

DIOSCOREA; Plumier

D. hastifolia; Nees

EUCALYCEAE HYPOGYNAE.—F. v. M.

ROXBURGHIACEAE.—LINDLEY

ROXBURGHIA; Jones

R. Javanica; Kunth

LILIACEAE.—HALLER

DIANELLA; Lamarck

D. revoluta; Brown

WURMBEA; Thunberg

W. tubulosa; Bentham
W. dioica; F. v. M.

BURCHARDIA; Brown

B. umbellata; Brown

BULBINE; Linne

B. semibarbata; Haworth

AGROSTOCRINUM; F. v. M.

A. stypandroides; F. v. M.

THYSANOTUS; Brown

T. multiflorus; Brown
T. triandrus; Brown
T. glaucus; Endlicher
T. Drummondii; Baker
T. pauciflorus; Brown
T. asper; Lindley
T. isantherus, Brown
T. tenellus; Endlicher
T. scaber; Endlicher
T. thyrsoideus; Baker
T. Patersoni; Brown
T. dichotomus; Brown
T. arbuscula; Baker
T. anceps; Lindley

HODGSONIOLA; F. v. M.

H. junciformis; F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

CASSIA; Brown

C. rigidifolia; F. v. M.

CHAMAECHILLA; F. v. M.

C. corymbosa; F. v. M.
C. spiralis; F. v. M.

CORYNOTHECA; F. v. M.

C. lateriflora; F. v. M.
C. dichotoma; F. v. M.
C. acanthoclada; F. v. M.

TRICORYNE; Brown

T. elatior; Brown
T. humilis; Endlicher

STYPANDRA; Brown

S. glauca; Brown

ANTHROPODIUM; Brown

A. curvipes; S. Moore
A. capillipes; Endlicher
A. Preissii; Endlicher

SOWERBAEA; Smith

S. laxiflora; Lindley

BARTLINGIA; F. v. M.

B. grandiflora; F. v. M.
B. squarrosa; F. v. M.
B. minor; F. v. M.
B. ramosa; F. v. M.
B. sessiliflora; F. v. M.
B. brachyphylla; F. v. M.
B. sessilis; F. v. M.

STAWELLIA; F. v. M.

S. dimorphantha; F. v. M.

JOHNSONIA; Brown

J. lupulina; Brown
J. pubescens; Lindley

ARNOCRINUM; Endlicher & Lehmann

A. Drummondii; Endlicher
A. Preissii; Lehmann

BORYA; Labillardiere

B. nitida; Labillardiere

CALECTASIA; Brown

C. cyanea; Brown

BAXTERIA; Brown

B. Australis; Brown

XEROTES; Brown

X. echinata; Cunningham
X. Serra; Endlicher
X. fimbriata; F. v. M.
X. rigida; Brown
X. Sonderi; F. v. M.
X. odora; Endlicher
X. Ordii; F. v. M.
X. Endlicheri; F. v. M.
X. sericea; Endlicher
X. purpurea; Endlicher
X. Preissii; Endlicher
X. effusa; Lindley
X. micrantha; Endlicher
X. caespitosa; Bentham
X. pauciflora; Brown
X. glauca; Brown
X. rupestris; Endlicher
X. collina; Brown
X. suaveolens; Endlicher
X. turbinata; Endlicher
X. spartea; Endlicher
X. leucocephala; Brown
X. hastilis; Brown

DASYPOGON; Brown

D. bromelifolius; Brown
D. Hookeri; Drummond

XANTHORRHOEA; Smith

X. gracilis; Endlicher
X. Preissii; Endlicher

KINGIA; Brown

K. Australis; Brown

PALMAE.—RAY.

LIVISTONA; Brown

L. Alfredi; F. v. M.

TYPHACEAE.—A. L. DE JUSSIEU

TYPHA; Tournefort

T. angustifolia; Linne

LEMNACEAE.—J. E. GRAY.

LEMNA; Linne

L. disperma; Hegelmeier
L. minor; Linne
L. gibba; Linne

FLUVIALES.—VENTENAT.

NAJAS; Linne

N. major; Allioni
N. tenuifolia; Brown

LEPILAENA; Drummond & Harvey

L. Australis; J. Drummond
L. Preissii; F. v. M.

CYMODOCEA; C. Koenig

C. zosterifolia; F. v. M.

POSIDONIA; Koenig

P. Australis; J. Hooker

RUPPIA; Linne

R. maritima; Linne

POTAMOGETON; Fuchs

P. natans; Linne
P. Drummondii; Bentham
P. obtusifolius; Mertens & Koch

TRIGLOCHIN; Rivinus

T. calcitrapa; Hooker
T. centrocarpa; Hooker
T. striata; Ruiz & Pavon
T. mucronata; Brown
T. procera; Brown

ALISMACEAE.—VENTENAT.

DAMASONIUM; Tournefort

D. Australe; Salisbury

PHILHYDREAE.—BROWN.

PRITZELIA; F. v. M.

P. pygmaea; F. v. M.

COMMELINEAE.—BROWN.

COMMELINA; Plumier

C. ensifolia; Brown

CARTONEMA; Brown

C. philhydroides; F. v. M.

XYRIDEAE.—SALISBURY

XYRIS; Gronovius

X. lacera; Brown
X. flexifolia; Brown
X. lanata; Brown
X. laxiflora; F. v. M.
X. gracillima; F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

JUNCEAE.—BROWN.

LUZULA; De Candolle
L. campestris, De Candolle

JUNCUS; Tournefort
J. gracilis; Brown
J. planifolius; Brown
J. caespititius, E. Meyer
J. bufonius, Linne
J. homalocaulis; F. v. M.
J. communis; E. Meyer
J. Radula; Buchenau
J. pallidus; Brown
J. maritimus; Lamarck
J. polyanthemus; Buchenau
J. prismatocarpus; Brown

RESTIACEAE.—BROWN.

TRITHURIA; J. Hooker
T. submersa; J. Hooker

APHELIA; Brown
A. cyperoides; Brown
A. nutans; J. Hooker
A. Drummondii; Bentham
A. Brizula; F. v. M.

CENTROLEPIS; Labillardiere
C. humillima; F. v. M.
C. polygyna; Hieronymus
C. alepyroides; Hieronymus
C. mutica; Hieronymus
C. glabra; F. v. M.
C. aristata; Roemer & Schultes
C. Drummondii; Hieronymus
C. pilosa; Hieronymus
C. strigosa; Roemer & Schultes

LYGINIA; Brown
L. barbata; Brown

ECDEIOCOLEA; F. v. M.
E. monostachya, F. v. M.

ANARTHRIA; Brown
A. scabra; Brown
A. laevis; Brown
A. gracilis; Brown
A. prolifera; Brown
A. polyphylla; Nees

LEPYRODIA; Brown
L. hermaprodita; Brown
L. monoica; F. v. M.
L. Muirii; F. v. M.
L. stricta; Brown
L. macra; Nees
L. Drummondiana; Steudel
L. glauca; F. v. M.
L. anacoctocolea; F. v. M.

RESTIO; Linne
R. Megalotheca; F. v. M.
R. applanatus; Sprengel
R. conferto-spicatus; Steudel
R. sphacelatus; Brown
R. deformis; Brown
R. crispatus; Brown
R. nitens; Nees
R. gracilior; F. v. M.
R. chaunocoleus; F. v. M.
R. laxus; Brown
R. ornatus; Steudel
R. leptocarpoides; Bentham
R. amblycoleus; F. v. M.
R. tremulus; Brown

LOXOCARYA; Brown
L. densa; Bentham
L. Benthami; F. v. M
L. pubescens; Bentham
L. fasciculata; Bentham
L. flexuosa; Bentham
L. cinerea; Brown

CALOSTROPHUS; Labillardiere
C. gracillimus; F. v. M.
C. exsulcus; F. v. M.

LEPTOCARPUS; Brown
L. scariosus; Brown
L. tenax; Brown
L. canus; Nees
L. coangustatus; Nees
L. aristatus; Brown
L. erianthus; Bentham

LEPIDOBOLUS; Nees
L. Preissianus; Nees
L. chaetocephalus; F. v. M.

CHAETANTHUS; Brown
C. leptocarpoides; Brown

ONYCHOSEPALUM; Steudel
O. laxiflorum; Steudel

ACALYCEAE HYPOGYNAE.—F. v. M.

CYPERACEAE.—HALLER.

CYPERUS; Tournefort
C. laevigatus; Linne
C. tenellus; Linne
C. ixiocarpus; F. v. M.
C. difformis; Linne
C. vaginatus; Brown
C. fulvus; Brown
C. alterniflorus; Brown
C. rotundus; Linne
C. stenostachyus; Bentham
C. congestus; Vahl
C. subulatus; R. Brown
C. lucidus; Brown
C. conicus; Broeckler

HELEOCHARIS; Brown
H. acuta; Brown
H. multicaulis; Smith
H. capitata; Brown.

FIMBRISTYLIS; Vahl
F. ferruginea; Vahl
F. capillaris; A. Gray

SCIRPUS; Tournefort
S. fluitans; Linne
S. arenarius; Bentham
S. cyperoides; Sprengel
S. setaceus; Linne
S. riparius; Sprengel
S. cartilagineus; Sprengel
S. nodosus; Rottboell
S. pugens; Vahl
S. lacustris; Linne
S. maritimus; Linne

LIPOCARPHA; Brown
L. microcephala; Brown

CHORIZANDRA; Brown
C. enodis; Nees
C. multiarticulata; Nees
C. cymbaria; Brown

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

CLADOCHAETE; Nees

C. chondrilla; Bentham
C. avenacea; Bentham

SCHOENUS; Linne

S. crassatus; F. v. M.
S. Benthami; F. v. M.
S. lanatus; Labillardiere
S. curvifolius; Poiret
S. capitatus; F. v. M.
S. ericifolius; Bentham
S. Drummondii; Bentham
S. barbatus; Boeckeler
S. flavus; Boeckeler
S. brevisetis; Poiret
S. Armeria; Boeckeler
S. aphyllus; Boeckeler
S. nitens; Poiret
S. cygneus; Nees
S. minutulus; F. v. M.
S. trachycarpus; F. v. M.
S. nanus; F. v. M.
S. pleiostemoneus; F. v. M.
S. hexandrus; F. v. M. & Tate
S. breviculmis; Bentham
S. unispiculatus; F. v. M.
S. obtusifolius; Boeckeler
S. grammatophyllus; F. v. M.
S. asperocarpus; F. v. M.
S. grandiflorus; F. v. M.
S. distans; F. v. M.
S. multiglumis; Bentham
S. efoliatus; F. v. M.
S. acuminatus; Brown
S. pedicellatus; Poiret
S. fascicularis; Nees
S. brevifolius; Brown
S. indutus; F. v. M.
S. bifidus; Boeckeler
S. odontocarpus; F. v. M.
S. humilis; Bentham
S. sculptus; Boeckeler
S. axillaris; Poiret
S. tenellus; Bentham
S. natans; F. v. M.
S. octandrus; F. v. M.
S. capillaris; F. v. M.
S. stygius; Poiret
S. tetragonus; Poiret
S. anceps; Poiret
S. Tricostularia; F. v. M.
S. Neesii; F. v. M.

LEPIDOSPERMA; Labillardiere

L. gladiatum; Labillardiere
L. effusum; Bentham
L. rupestre; Bentham
L. tetraquetrum; Nees
L. exaltatum; Brown
L. longitudinale; Labillardiere
L. angustatum; Brown
L. Drummondii; Bentham
L. Brunonianum; Nees
L. tuberculatum; Nees
L. resinosum; F. v. M.
L. viscidum; Brown
L. costale; Nees
L. aphyllum; Brown
L. gracile; Brown
L. pubisquameum; Steudel
L. scabrum; Nees
L. tenue; Bentham
L. leptostachyum; Bentham
L. leptophyllum; Bentham
L. striatum; Brown
L. carphoides; F. v. M.

GAHNIA; R. et G. Forster

G. articulata; F. v. M.
G. arthrophylla; F. v. M.
G. glomerata; F. v. M.
G. Preissii; F. v. M.
G. lata; F. v. M.
G. riparia; F. v. M.
G. schoenoides; F. v. M.
G. juncea; F. v. M.
G. vaginalis; F. v. M.
G. elynanthoides; F. v. M.
G. trifida; Labillardiere
G. decomposita; Bentham
G. polyphylla; Bentham
G. ancistrophylla; F. v. M.
G. lanigera; Bentham
G. aristata; F. v. M.
G. deusta; Bentham

CAUSTIS; Brown

C. dioica; Brown

REEDIA; F. v. M.

R. spathacea; F. v. M.

ECANDRA; Brown

E. aristata; Brown
E. pauciflora; Brown

CAREX; Rupplus

C. inversa; Brown
C. paniculata; F. v. M.
C. tereticaulis; F. v. M.
C. Preissii; Nees
C. Pseudo-Cyperus; Linne

GRAMINEAE—HALLER.

ERIOCHLOA; Humboldt, Bonpland et Kunth

E. polystachya; Humboldt et Kunth

PASPALUM; Linne

P. distichum; Linne

PANICUM; Tournefort

P. coenicolum; F. v. M.
P. sanguinale; Linne
P. leucophaeum; Humboldt & Kunth
P. gracile; Brown
P. reversum; F. v. M.
P. Crus Galli; Linne
P. pauciflorum; Brown
P. effusum; Brown
P. decompositum; Brown
P. spinescens; Brown

SETARIA; Palisot

S. glauca; Palisot
S. macrostachya; Humboldt & Kunth
S. viridis; Palisot
S. verticillata; Palisot

SPINIFEX; Linne

S. hirsutus; Labillardiere
S. longifolius; Brown

PEROTIS; Aiton

P. latifolia; Aiton (P. rara; R. Brown)

POLYPOGON; Desfontaines

P. fugax; Nees
P. tenellus; Brown

TRAGUS; Haller

T. racemosus; Haller

NEURACHNE; Brown

N. alopecuroides; Brown
N. Muelleri; Hackel

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

IMPERATA; Cyrillo
I. arundinacea; Cyrillo

ERIANTHUS; L. C. Richard
E. fulvus; Kunth

LEPTURUS: Brown
L. cylindricus; Trinius

HEMARTHRIA; Brown
H. compressa; Brown

ANDROPOGON; Royen
A. sericeus; Brown
A. Ischaemum; Linne
A. punctatus; Roxburgh
A. procerus; Brown
A. exaltatus; Brown
A. bombycinus; Brown
A. contortus; Linne
A. Gryllus; Linne
A. Halepensis; Sibthorp & Smith
A. Australis; Sprengel

ANTHISTIRIA; Linne
A. Australis; Brown
A. avenacea; F. v. M.
A. membranacea; Lindley

ALOPECURUS; Linne
A. geniculatus; Linne

EHRHARTA; Thunberg
E. laevis; Sprengel
E. stipoides; Labillardiere

ARISTIDA; Linne
A. stipoides; Brown
A. arenaria; Gaudichaud
A. calycina; Brown

STIPA; Linne
S. elegantissima; Labillardiere
S. flavescens; Labillardiere
S. teretifolia; Steudel
S. compressa; Brown
S. Drummondii; Steudel
S. pycnostachya; Bentham
S. setacea; Brown
S. semibarbata; Brown
S. heminogon; Bentham
S. pubescens; Brown
S. Eriopus; Bentham
S. trichophylla; Bentham
S. scabra; Lindley
S. micrantha; Cavanilles
S. Dichelachne; Steudel

ECHINOPOGON; Palisot
E. ovatus; Palisot

DIPLOPOGON; Brown
D. setaceus; Brown

AMPHIPOGON: Brown
A. debilis; Brown
A. strictus; Brown
A. laguroides; Brown
A. cygnorum; Nees
A. turbinatus; Brown

PAPPOPHORUM; Schreber
P. commune; F. v. M.

SPOROBOLUS; Brown
S. Virginicus; Humboldt & Kunth
S. Indicus; Brown
S. Lindleyi; Bentham

AGROSTIS; Linne
A. venusta; Trinius
A. Solandri; F. v. M.
A. quadriseta; Brown
A. cylindrica; Brown

ERIACHNE; Brown
E. glauca: Brown
E. aristidea: F. v. M.
E. ovata; Nees
E. scleranthoides; F. v. M.
E. obtusa; Brown

DANTHONIA; De Candolle
D. bipartita; F. v. M.
D. penicillata; F. v. M.
D. nervosa; J. Hooker

ASTREBLA; F. v. M.
A. pectinata; F. v. M.
A. triticoides; F. v. M.

CYNODON; L. C. Richard
C. Dactylon; L. C. Richard
C. tenellus; Brown

CHLORIS; Swartz
C. acicularis; Lindley
C. pallida; Hackel
C. scariosa; F. v. M.

ELEUSINE; J. Gaertner
E. cruciata; Lamarck
E. digitata; Sprengel

POA; Linne
P. Labillardieri; Steudel
P. homomalla; Nees
P. caespitosa; G. Forster
P. Maxwelli; Bentham
P. nodosa; Nees
P. lepida; F. v. M.
P. fluitans; Scopoli
P. syrtica; F. v. M.
P. ramigera; F. v. M.

FESTUCA; Dillenius
F. scirpoides; F. v. M.
F. litoralis; Labillardiere

DIPLACHNE; Palisot
D. Muelleri; Bentham
D. fusca; Palisot

TRIODIA; Brown
T. Mitchelli; Bentham
T. irritans; Brown

BROMUS; Dillenius
B. arenarius; Labillardiere

ERAGROSTIS; Palisot
E. tenella; Palisot
E. trichophylla; Bentham
E. pilosa; Palisot
E. diandra; Steudel
E. Brownii; Nees
E. speciosa; Steudel
E. eriopoda; Bentham
E. setifolia; Nees
E. falcata; Gaudichaud

ELYTHROPHORUS; Palisot
E. articulatus; Palisot

TRIRHAPHIS; Brown
T. mollis; Brown
T. bromoides; F. v. M.
T. danthonioides; F. v. M.

Digitized by Google

LIST OF EXTRA-TROPIC WEST AUSTRALIAN PLANTS—*continued.*

AGROPYRON; J. Gaertner
A. scabrum; Palisot

ARUNDO: Tournefort
A. Phragmites: Dodoens

ACOTYLEDONEAE.—A. L. de Jussieu.

Acotyledoneae Vasculares.—Meissner.

RHIZOSPERMAE.—G. WEBER.

SALVINIA; Micheli
S. cucullata; Roxburgh

MARSILEA; Linne
M. quadrifolia; Linne

PILULARIA; Vaillant
P. globulifera; Linne

ISOETES; Linne
I. tripus; A. Braun
I. Drummondii, A. Braun

LYCOPODINAE.—SWARTZ.

LYCOPODIUM; Ruppius
L. Carolinianum: Linne

SELAGINELLA; Palisot
S. Preissiana; Spring
S. uliginosa: Spring

PHYLLOGLOSSUM; Kunze
P. Drummondii; Kunze

FILICES.—LINNE.

OPHIOGLOSSUM; Tournefort
O. vulgatum; C. Bauhin

LINDSAYA; Dryander
L. linearis; Swartz

ADIANTUM; Tournefort
A. Aethiopicum; Linne

CHEILANTHES; Swartz
C. velica; F. v. M.
C. distans; A. Braun
C. tenuifolia; Swartz

PTERIS: Linne
P. aquilina; Linne

ASPLENIUM; Linne
A. Trichomanes; Linne
A. flabellifolium; Cavanilles
A. furcatum; Thunberg
A. marinum; Linne

ASPIDIUM; Swartz
A. unitum; Swartz

GRAMMITIS; Swartz
G. Reynoldsii; F. v. M.
G. rutaefolia; Brown
G. leptophylla; Swartz

10.—FOREST RESOURCES.

(By the late J. Ednie-Brown, Conservator of Forests.)

I have much pleasure in supplying a condensed account of the Forests of Western Australia, which however, necessarily, cannot be so comprehensive as one would wish in consideration of the magnitude and increasing importance of the interest involved.

In all my experience of forests I have not been privileged to deal with anything so full of possibilities towards permanent national wealth as is the case with those in this State, and thus I may be permitted, first of all, to indicate some general facts bear

Digitized by Google

upon the subject and appropriate to a full and better understanding of this branch of rural economy in these days.

A few years ago Australia was known, to the great productive population of the world, as a source only for the supply of gold and wool; and to-day even, notwithstanding her vast natural forests, she has no statistical position as an exporter of timber or of materials manufactured from it. This fact, in the face of an estimated area of 47,000,000 acres as spread over all the States upon which useful marketable timber is growing, is significant, and shows one how low we stand internationally in the timber trade, notwithstanding our great advantages and possibilities.

It is true that the phrase "Australian Hardwoods" is now well known in commercial circles all over the world. We see it quoted in our cables from Europe, America, India, and Africa, and we read of it in the most important scientific journals and magazines of the present day; and although it embraces a large and comprehensive subject, and one of very great importance commercially to these States, still, strange to say, the scope of its application and the intrinsic value of the commodity to which it refers are extremely vague to the ordinary reader, who is equally in the dark as regards the systematic administration of the forest lands as a part of sound economy. We have, there is no doubt, to acknowledge one example of systematic administration in the States, and to recognise its existence to some extent in two other cases, but, considered as a whole, Australia is practically a stranger to the science and art of arboriculture, as it is, unquestionably, to the value of its 600 species of timber trees. I am, nevertheless, pleased to be able to state that the forests of Western Australia are yet practically unharmed for all purposes of successful conservation and ordinary thinnings and clearings of the matured timber. This fact must be emphasised to the people and to the markets of the world generally. The other States, however, cannot say the same thing.

The forests are Nature's gift, and should be looked upon and dealt with accordingly, as an inestimable inheritance of great commercial and climatic value; besides, much of the land upon which the best timber grows is, as a rule, of little or no value for agricultural purposes, and I maintain, without any fear of logical contradiction, that what is now upon it is the very best kind of crop that will ever be seen there. To destroy it therefore, for the sake of a few more blades of grass, is suicidal and reprehensible in the extreme.

I want it to be distinctly understood that, although I touch upon the timbers growing upon other portions of the State, this is practically a report upon its South-Western District only, and as this district embraces what may be termed the only real commercial forests of the territory, the purposes of this contribution *to the* "Year Book" will be thereby served.

Digitized by Google

The Principal Forest Trees of the State.

The following is a list of the principal members of our forest flora, so far as yet known, giving their natural orders, systematic and vernacular names, and then a short descriptive reference to each tree showing its uses and possibilities :—

Natural Order.	Systematic Name.	Vernacular Name.
Leguminosæ	Acacia saligna	Wattle.
"	" acuminata	Raspberry Jam.
"	" microbotrya	Badjong Acacia or "Wattle Gum."
Myrtaceæ	Agonis flexuosa...	Peppermint tree.
Proteaceæ	Banksia verticillata	River banksia.
"	" littoralis	Sea-side banksia.
"	" attenuata	Narrow leaved banksia.
"	" Menziesii	Menzies' banksia.
"	" ilicifolia	Holly-leaved banksia.
"	" grandis	Great-flowering banksia.
"	" dentata	Toothed banksia.
Casuarineæ	Casuarina Fraseriana }	Sheaoaks.
"	" glauca ... }	
"	" Decaisneana }	
Myrtaceæ	Eucalyptus marginata ...	Jarrah.
"	" diversicolor ...	Karri.
"	" gomphocephala...	Tuart.
"	" cornuta	Yate gum.
"	" calophylla ...	Red gum.
"	" loxophleba ...	York gum.
"	" patens	Blackbutt.
"	" oleosa	Mallee.
"	" rostrata	Flooded gum of the Interior.
"	" rudis	" " South-West.
"	" redunca	Wandoo.
"	" decipiens... ...	Flooded gum.
"	" ficifolia	Crimson-flowering gum.
"	" longicornis ...	Morrell.
"	" salmonophloia ...	Salmon gum.
"	" salubris	Gimlet-wood.
"	" megacarpa ...	Blue gum.
"	" pyriformis ...	Red-flowering Mallee.
Coniferæ	Frenela verrucosa	Cypress Pine.
Myrtaceæ	Melaleuca Leucadendron ...	Paperbark.
Santalaceæ	Santalum cygnorum	Sandalwood.

The forests of Western Australia contain, as we see in this list, a very considerable number of genera and species of trees, but of these a few only are at present known to be of any real commercial value. It is, of course, to these that this report has special reference, and in order to clearly specify them, I shall now enumerate their peculiarities, properties and uses.

Jarrah

(*Eucalyptus marginata*).

This is without doubt the principal timber tree in the Western Australian forests, and no one would for a moment dream of speaking of it in other terms. It is predominant above all others in its extent of forest, the various uses to which it is or can be applied, the part which it is now taking in the great timber export of the State, and the esteem in which it is locally held. Jarrah and Western Australia are almost synonymous words, and, as this has been the case from the earliest days since the foundation of the State, so it will now remain so long as a Jarrah forest exists. I do not mean by these remarks *to disparage in* the least degree any of the

Digitized by Google

other commercial woods of the country, but simply to emphasise the fact that Jarrah is the principal indigenous timber of this part of the Australian Continent.

In general appearance the Jarrah resembles what is known in the other States as the stringy-bark. Its likeness to this division of the Eucalyptus family is very marked. The bark is therefore persistent, fibrous, and of a dark grey colour, although more deeply indented in its longitudinal furrows than the stringy-bark.

It is not uncommon to find considerable areas of Jarrah forest where many of the matured trees attain heights of from 90ft. to 120ft., with good stems 3ft. to 5ft. in diameter, and 50ft. to 60ft. to the first branch. Such places would be described as first-class Jarrah forest. Taking an average, however, of these forests, I think a Jarrah tree of a good healthy stamp and one representing a fair specimen of its kind would run about 90ft. to 100ft. in height, and from 2½ft. to 3½ft. in diameter at the base. Under such conditions and in fairly favourable habitats, trees of this size may be expected to be sound and convertible into good marketable timber without much waste.

The Jarrah is confined in its distribution to what is known as the South-Western Division of the State, and this is practically its geographical limit. This district lies along the Western coast of the State, between latitudes 31 and 35 degrees South, and longitude 115 and 119 degrees East, and represents an area of country extending nearly 350 miles from North to South, and between 50 to 100 miles from East to West, embracing all that portion of the country upon which the heaviest rains of the season fall, the annual average rainfall representing 40 inches in the South, and 35 inches in the North.

The Jarrah is purely a semi-coastal tree, by which I mean that it is not found anywhere strictly beyond the influence of the sea, and yet is not at all partial to the direct effects of the sea-breezes. Perhaps the best forests of the species are found from 20 to 30 miles off the coastal line. Whether this fact is only co-existent with the heavy rainfall, and whether, with an equal rainfall further inland, the growth would be as good as that along the coast, I am not prepared to say.

The principal habitat of the tree is therefore along the table-lands and slopes of the Darling Range, which runs through nearly the whole of the South-Western District. Perhaps the best areas of Jarrah lie along that portion of this range from the Blackwood River North to the Helena River, with the choicest portions midway between these two points.

In all cases this tree delights in an ironstone formation, and it would almost appear as though the rougher and the more the site is composed of ironstone rocks and barren of almost any other vegetation, the better the tree will grow. It is certainly beyond a doubt that, under such circumstances, the timber attains its greatest degree of soundness, strength, and general durability. There are,

Digitized by Google

it is true, some fine belts and patches of Jarrah forest to be found upon many of the lower-lying portions of the district referred to, and where the geological formation is composed of ironstone—as for instance in the country lying between Quindalup and Karridale—the timber is good in every respect; but where these lower-lying portions have fairly good sandy-loam soils the timber is sure to be more gummy and less durable than that on the higher ranges.

Much has, of course, been said and written about this timber, but it is not my intention to wade through these details and give the results here; suffice it to say that it is one of the most valuable of Western Australian, and the best known of all Australian, timbers. My own opinion of it is that it is one of great excellence, and may be looked upon as one of the principal timbers of Australia for general constructive purposes. I have been shown many specimens with surprising records of durability in the ground and in water, salt and fresh, and these of themselves testify to its wonderful excellence. I have, however, observed also that this timber is variable in its chief attractive properties, and that it is sometimes less durable than at others. This no doubt is accounted for by cutting at the wrong season of the year, by the character of the soil upon which it is grown, and other matters which I shall deal with later on. The weight of the wood, when newly cut, is a little over 70lbs. per cubic foot, which is reduced to 60lbs. when thoroughly seasoned. It is red in colour, polishes well, and is comparatively easily worked. Some of the principal uses to which it is as yet applied are:—Wood-blocking, piles, jetties, bridges, boat-building, posts, furniture, railway sleepers. It makes the best charcoal of any timber in the State. Its adaptability for all kinds of out-door work is well known, and hence it is considered the staple timber of Western Australia.

Karri

(*Eucalyptus diversicolor*).

This is the giant tree of Western Australia, if not of the whole Australian Continent. The latter remark is, however, disputed; but the assertion is made without much fear of contradiction. It is not so well known as the Jarrah, owing to the limited field of its growth, and the, at present, comparative inaccessibility of its haunts.

There is much to be said in favour of this member of our forest flora. In its young stage it can hardly be beaten as a highly ornamental tree, being regular in its growth, straight, and umbrageous, its leaves changing in a few years from being of an oval shape to those long broad ones which mark its more matured condition. I consider that in this respect, and in its general appearance as well, it resembles greatly the sugar gum of South Australia (*E. corynocalyx*). There is no doubt that this is the finest and most graceful tree in the Australian forests. When it is matured, and has attained large dimensions, its appearance is simply grand i extreme, and in this respect at least the Karri puts the Jarr

Digitized by Google

into the shade. The trees are almost always of straight growth, and tower skywards for great heights without having even the semblance of a branch. So marked are they in these respects that they look like a mass of upright candles. The bark is smooth, yellow-white in appearance, but not persistent like the Jarrah. It, therefore, peels off in flakes each year, and thus the tree has always a clean bright appearance. In consequence of this it is frequently spoken of as a white gum, although known as the Karri. The height of these trees is almost phenomenal, presenting astonishing productions of nature. As a rule an average tree may be put down at 200ft. in height and 4ft. in diameter at 3ft. to 4ft. from the ground, and about 120ft. to 150ft. to the first branch. Trees of this size are generally sound in every respect, and may be expected to turn out timber free from the usual blemishes of dry rot, gum veins, etc., to which large trees are frequently subject.

Trees of the size indicated are common objects in the Karri forests, but much larger specimens are of course met with now and again. For instance, on the Warren River, it is not unusual to find trees which attain 300ft. in extreme height, over 180ft. in height to the first limb, and from 20ft. to 30ft. in circumference at the base. Of course these are exceptional cases, but still they do exist. The finest tree of this kind which I came across during my trip was at Karridale (M. C. Davies & Co.). This is called "King Karri," and the following are some measurements taken in connection with this grand specimen:—

34ft. in circumference at 3ft. from the ground.

160ft. to the first branch.

14ft. in circumference at the first limb.

Over 200ft. in extreme height.

From these figures it will be seen that the bole of this tree from the bottom to the first limb contains nearly 6,000 cubic feet of timber. This means that it has a weight of over 40 tons in all; that it would take one of our ordinary mills at least four days to convert it into sawn stuff; and that it would form about a quarter of the loading capacity of one of the ships which form the fleet of our present export timber trade. These figures speak for themselves, and need no comment. I question if there could be found appliances in the State at the present moment to deal with this forest monarch. Similar cases might be cited, but this one will give a fair idea of the enormous dimensions to which this species of timber sometimes attains.

The "Karri" is strictly confined in its range of locality to the South-Western portions of the great South-Western Division of the State, or that part of the latter lying between Cape Hamelin on the West and the Torbay Estate, near Albany, on the East. Its geographical confines are embraced within longitudes 115 degrees and 118 degrees East, and latitudes 34 degrees and 35 degrees South. The timber is red in colour, and has very much the appearance of the Jarrah; indeed, so like are the two, that it takes a good

Digitized by Google

judge of both to distinguish each. It is hard, heavy, elastic, and tough, but does not dress, nor can it be wrought so easily as its contemporary.

It is said that for underground purposes or waterworks the timber is certainly inferior to some other kinds, especially to that of the jarrah, and there can be no doubt about this fact, which has been demonstrated time after time in the State. And still it is only fair to say that instances have been brought under my notice where posts and slabs of the timber have been known to have been in the ground for 30 and 40 years with only an ordinary amount of decay. This is certainly very puzzling, and makes one doubtful in regard to the conclusions generally which have been arrived at in regard to this timber. However, as may be seen from the comparative tests which have been made in regard to its tensile, crushing, and breaking strength, it ranks as a timber of a very high order indeed. We must, therefore, pending other and more general experiments, look upon the Karri timber as one best suited for superstructural works. For bridge planking, shafts, spokes, felloes, and large planking of any sort, flooring, general wagon work, and beams, it is unequalled in this State. For street blocking it is also valuable, and for this purpose seems to be equal to, if not better than, its colleague, the jarrah, in that its surface by the wear caused by the traffic does not render it so slippery for the horses' feet. As is well known, this timber is being largely exported for the London street paving.

Tuart

(Eucalyptus gomphocephala).

This is another of the commercial trees of the State, and although the area occupied by it is comparatively limited in extent, still its importance is great, and hence it must have a place in this section of the classification. The technical designation (*gomphocephala*) has reference to the markedly peculiar swelling or hanging-over appearance of the lid of the calyx tube. This is a very marked feature of the species.

This handsome Eucalypt has a wonderfully bright and cheerful appearance in the forest. The bark is of a greyish-white colour, and is smoothly crinkled and persistent throughout. The trees, therefore, are always clean and bright looking. In the young stage, the species forms a very ornamental tree, and is planted as such in some of the other States. It is straight, well clothed, and has a beautiful bright-green leaf, and in this respect is not unlike the Karri. When the tree has developed out of the seedling and sapling stages, the leaves get more narrow and elongated than formerly. In height, this species attains sometimes to 150ft., and in circumference to more than 22ft. at the base. In some cases the trees run up to 70ft. and 80ft. without a branch, but, as a rule, they have heavy tops with boles about 40ft. to the first branch. They do not form a dense forest, but appear to like plenty of individual room, although this observation may be only one of conjecture from the present appearance of what remains of the Tuart forests.

Digitized by Google

Sandalwood

(*Santalum cygnorum*).

This, although only a tree or shrub, is an important factor in the timber industry of Western Australia, and therefore has a place in the description of those forest products which have assisted to build up the export trade of the State. This species is somewhat peculiar in its appearance, and certainly has more of the character of a large bush than of a tree proper. It has a low depressed habit, and is consequently decidedly branchy and heavily topped. It is seldom found more than 8in. in diameter, and from 12ft. to 18ft. in height, with stems about 8ft. to 10ft. in length. In a good many cases, however, stems have been found measuring over a foot in diameter and 12ft. in length, these weighing from 3cwt. to 6cwt. Trees have been cut which produced timber weighing more than half a ton. This tree is found fairly distributed over the inland parts of the State, except in the South-Western portion of it. It grows most freely on barren, sandy soils, and is frequently intermixed with the Wandoo, York Gum, and Morrell. It is not gregarious. The present revival in the Sandalwood trade is encouraging in view of the success which has attended the experiment of the Bureau of Agriculture in Sandalwood culture at Pingelly which, I am confident, warrants further efforts in this direction.

This brief review of what are at present known and recognised as the trees which supply the export timber trade of the State, does not comprise the whole of the forest wealth of the territory, and a brief reference to the principal members of what may, for distinctive reference, be classified as being of a secondary type is necessary in order to make this article more complete, more especially as I consider that some of these trees possess timber of a high class, and will yet become, if they are not now, of considerable importance to the State.

Wattle

(*Acacia saligna*).

The word "Wattle" is rather ambiguous, and, in Australia generally, is applied to any species of the Acacia family. In this case its application, however, has reference only to *A. saligna*, from which the bark containing the mimosa tannin in this State is obtained. In Müeller's "Select Extra-tropical Plants," it is designated *A. leiophylla*, on account of the smooth character of the leaves.

The Wattle is a small tree at best, rarely exceeding 30ft. in height and one foot in diameter. It is, however, of a very spreading habit, with timber of considerable size and good girth; consequently each tree bears a fair quantity of bark. In appearance, it is a somewhat handsome member of our forest flora, and as it is umbrageous and lives a fairly good number of years, it may be considered a fitting subject for avenue and shade purposes. I have seen it in various parts of the State South of the 30th degree of latitude, but as to whether it was in all cases the result of natural

Digitized by Google

growth I am unable to say; possibly not, as, being a rather handsome tree, it may in some instances have been planted for ornamental purposes. In any case, however, the South-Western District of the State is the natural habitat of the species. It appears to frequent deep rich places, where there is a fair amount of moisture, although not of a stagnant nature. A special feature of this tree, and one which commends itself for cultural purposes, is that it sends out suckers from the old stump after the parent tree has been cut down. This is a valuable peculiarity of the species. According to analysis, the bark contains some 30 per cent. of tannic acid, and as the tannin-bearing trees here are somewhat scarce, its cultivation should form a subject for industrial attention.

Raspberry Jam

(*Acacia acuminata*).

This is another acacia, and well known in the State. It is a small tree of about 30ft. in height, with stems reaching to one foot in diameter, and boles 10ft. to 12ft. in height. It is of a handsome rounded shape when allowed to spread out its branches, and the appearance of the leaves is bright green and somewhat pendulous. The vernacular name is derived from the peculiar scent of the wood, which is wonderfully similar to that of raspberries. This is truly remarkable, and has to be smelt to be appreciated. An oil of a similar flavour is obtained from the wood by distillation. The wood is very dense, and is largely used for fencing, survey posts, etc. In the ground it seems to last for ever, and has the peculiar faculty of being impervious to white ants. It is a beautiful wood, dark in the middle, with a white margin on either side, very heavy, and would make an excellent timber for cabinet and ornamental work of all kinds. At present it is sometimes turned into pipes and walking sticks. A large quantity is now being yearly cut down and burned in clearing the land.

Badjong

(*Acacia microbotrya*).

This is what is known to the colonists as the "Wattle Gum." It is found here and there along the flats and river banks of the humid districts in the South-West, but nowhere in the dry, hot portions of the State. Its common name has reference to its distinctive peculiarity of yielding or exuding large quantities of gum each year. For the production of this useful and valuable material it is a tree of some commercial interest. I have noticed it over 40ft. in height in favourable places, with a diameter of nearly 18in. Although I have not actually seen it tried for the purpose, I am of the opinion that the timber of the species might, with advantage, be utilised as ordinary barrel staves and for soft wooded turnery of various kinds.

Peppermint

(*Agonis flexuosa*).

This is sometimes called the "Willow Myrtle" of the South-Western portion of the State, but it is more generally known

Digitized by Google

the "Peppermint Tree." It is a well-known tree here, and is found abundantly along the sand banks and river estuaries of the Western coast. It is therefore purely coastal, and is seldom seen further inland than 15 or 20 miles, and then only in the flats and sand-drifts or washes of the more sheltered portions of the rivers. In exceptional cases I have seen it 40 miles from the coast, but only a few individuals in specially favourable spots. The species is very handsome, and, with its dense, drooping foliage, makes a fine tree for shelter, shade, and ornamental purposes. As a tree for street planting it is well suited, and may be seen in the streets of Albany, Bunbury, and Busselton, where, at the latter township especially, there are some fine avenues of it. It may also be seen growing in Adelaide Terrace, Perth. The timber is hard, durable, and makes an excellent firewood. The leaves, when crushed, emit a strong perfume resembling peppermint, hence the name. The oil distilled rom the leaves possesses strong antiseptic properties. The "Peppermint Tree" often grows to over 50ft. in height, with diameters of stem two to three feet at the bottom.

Banksia

(*B. verticillata, B. littoralis, B. attenuata, B. Menziesii, B. ilicifolia, B. grandis, B. dentata*).

These trees and shrubs form an interesting feature in the forest flora of this part of Australia. They are, however, with one or two exceptions, more ornamental than utilitarian, and I shall therefore only refer to them briefly in a body, and not individually. What is known as the "River Banksia" (*B. verticillata*) attains the dimensions of a fair-sized tree, and is always found growing on the rich alluvial flats or banks of rivers. It is a rather handsome and well-grown tree, and when in flower with its yellow-red, erect cones, combined with its light green leaves, has a very striking appearance. The wood of this species is soft and light-coloured, and is used in furniture making and for some purposes in house fittings. It would, I think, make good staves for casks. The timber of all the Banksias is largely used for firewood.

Sheaoak

(*Casuarina*).

Of these Casuarinas there are several species in the State which come under the category of trees. The ones enumerated in the list at the beginning of this section of the forest trees of the State are the most prominent members of the family here. *Casuarina Fraseriana* is the species chiefly found in the South-Western Districts. It yields a good timber for furniture purposes; is fairly light in weight, and beautifully grained in its growth, and is (or was) largely used for shingles, for which purpose it is well adapted, being easy to split and durable. It is also a very ornamental tree, and is therefore suitable for planting in parks and pleasure grounds. It is very gregarious, and is found in clumps here and there through the Jarrah and Karri forests. I have seen it on dry knolls, upon poor soils, and upon rich river flats as well, but always of greater size and beauty upon the latter. The

Digitized by Google

other Casuarinas mentioned in my list, as well as other species not enumerated, are not of much commercial value, although each has its own local uses.

Red Gum

(*Eucalyptus calophylla*).

Next to the Jarrah there is no tree which is so widely distributed over the timber regions of the State as the Red Gum. We find it intermixed with the Jarrah, Wandoo, York Gum, and Karri. In some places it takes precedence, as regards numbers, of any of the trees mentioned, but in only a very few cases can it be called gregarious, and even then only upon comparatively small patches. All over the South-Western Division of the State it is therefore a common member of the forests, and this, so far as I am aware, embraces the extent of its local habitat. This gum is a "kino" of some considerable value for its medicinal properties. It exudes from the tree in a thick treacly condition during the summer—generally from the trunk, but frequently from the main limbs as well, thus giving the leaves and herbage under the trees the appearance of being bestrewed with blood. It is worth about £25 to £30 per ton, and is easily collected, either in the liquid or dry state. It is used locally for tanning purposes. The bark of this species is of a hard, rough, and irregularly-furrowed or broken appearance, therefore adding considerably to its rugged aspect. Unfortunately, although such a widely distributed species, its timber can only, at present, be classed as of second rate quality. This, of course, is owing to the gum veins which intersect it in every direction; otherwise the wood is of an excellent kind, and is used locally in short lengths for such purposes as axe and other handles, spokes, naves, rails, harrows, shafts, and other farming necessities. It is not used for underground work of any kind, owing to its ready absorption by white ants. It makes splendid firewood.

The excellence of this tree, however, lies in its uniform umbrageous and spreading character, and this gives it the unqualified name of being the best shade gum in our forests. When standing alone, and allowed to spread and develop its branches, this tree forms a very handsome, picturesque, and shady object. In those portions of the country which are devoted to stock raising, a few specimens of the kind become a necessity in the summer months. The flowers of the tree are large, white, prolific, and full of honey. In consequence of this fact the apiculturists of South Australia are planting it round their holdings. It is fast-growing and highly suited for ornamental planting.

Wandoo

(*Eucalyptus redunca*).

This is sometimes referred to as the "White Gum," but more generally, I think, as the "Wandoo." The specific name which it bears refers to the curvature of the lid of the seed vessel, but this is hardly sufficiently pronounced to justify the deduction. "Wandoo" is the aboriginal *term applied to the* species. It has a very la

range of habitat, and may be said to be the principal forest tree on the Eastern slopes of the Darling Range.

In appearance, it has a yellow-whitish, blotchy look, not clean-white like the Karri, but always more or less speckled, though still smooth. It is a well-balanced, sturdy-looking tree, and is at all times a clean bright object in the landscape. As a rule this tree is not very large, but, upon an average, specimens 60ft. to 80ft. in height, with diameters of from 1ft. to 2½ft. may be taken as fairly representative of the species. It is true that I have seen individual trees a little over 100ft. high and 3ft. in diameter at the base, but these were exceptionally large for the class.

I am pleased to say that the timber of this tree is, although occasionally spoken of in an indifferent manner, of a rather superior character. It is hard, very dense, somewhat dull yellow or darkish yellow in colour, durable, and remarkable in its lateral and compressive strengths. At Pingelly I was shown a fence post which was said to have been nearly 50 years in the ground; and Mr. Warburton, of Yeriminup, gave me a piece of white gum which he said had been in the ground as a fence post for over 40 years; this appeared to be in a perfectly sound condition. For naves, cart and buggy shafts, spokes, felloes, and other rural purposes, it is frequently used, and I think for railway truck construction, receiving buffers, and other works requiring resisting strength it is of great importance, and will eventually vie with, if not surpass, the Tuart timber for these purposes. I look upon it as a timber highly suitable for mining work. It weighs over 70lbs. per cubic foot even after it has been seasoned for a considerable time.

York Gum

(*Eucalyptus loxophleba*).

The specific name given to this tree bears reference to the oblique veins of the leaves. It seems to be scattered, in a more or less degree, all over the country occupied by the Wandoo, that is the Eastern slopes of the Darling Range, and occupies a distinct tract of country some miles in width, extending from North of Bejoording, running Southwards through Northam, York, Beverley, Pingelly, Bannister, and Ettakup, and thence bearing South-East to the Pallinup River. The bark of this species is rough, dark coloured, and persistent, and easily distinguishable from the Wandoo by its dark, rugged appearance; otherwise the two trees have a resemblance in growth, habit, and general surroundings. In height, the York Gum rarely exceeds 100ft., and a diameter at base of 3ft.; more generally it is about 70ft. to 80ft. in height and 18in. in diameter. It appears to grow in any kind of soil, but certainly has a preference for the richer and loamy deposits found along the depressions and watercourses of the country. The wood is exceedingly hard, heavy, and tough, and it is considered one of the best in the State for the construction of naves, felloes, and general wheelwright work. This being the case, its usefulness might be

Digitized by Google

extended to works where toughness and general strength are required. It is reddish in colour.

Mallee

(*Eucalyptus oleosa*).

There is not much to say about this member of our forests. It is found ranging in different parts of the inland scrubs of Australia. I have seen it in South Australia, Victoria, and New South Wales, but always only about 20ft. to 30ft. in height, and with proportionate girth of stems.

Crimson Flowering Gum

(*Eucalyptus ficifolia*).

This is referred to not because of its value as a timber tree, but simply as a gorgeous and remarkable specimen of the forest flowering-trees of Western Australia. It is a very handsome, branchy, and umbrageous, small tree; its foliage is dark shining green, with the leaves standing out more flat, and not edgeways, as is usual with the Eucalyptus family generally. The specimens which I saw ranged from 20ft. to 40ft. in height, with stems averaging about a foot in diameter. The bark is rough, and somewhat like the red gum; the wood is a dark blood-like colour. These trees had their branches sweeping down to the ground amongst the ferns. Elevation of the site above the sea about 100ft.

Flooded Gum of the Interior

(*Eucalyptus rostrata*).

This, perhaps, is one of the most widely distributed Eucalypts on the Australian Continent. Having now seen it here, I can affirm its being indigenous to all the States of the Commonwealth, but perhaps under different physical circumstances in each territorial division of the country. In South Australia and Victoria no tree has, perhaps, supplied more material for railways, bridges, jetties, piles, and telegraph poles than this has done. In those States it is the principal timber tree and, although it has not—through want only of convenience of land carriage—been much used in the public works of New South Wales, the forests of it along the Murray, Darling, Murrumbidgee, and other rivers in that State are second to none on the Continent. This, I consider, is the true Red Gum of Australia, and no tree is better known to our explorers than it. Nearly all of the land marks, and camp locations and "signs," left by these intrepid adventurers, have been recorded upon trees of this species. The tree appears to crop up here and there along the watercourses of the interior of Australia, but of course there only as a fringe, and in a stunted, branchy, and gnarled form. In those portions of this State through which I have travelled, the localities upon which the species was found invariably indicated the courses of the creeks and those low-lying parts of the country where claypans exist, and the storm waters had *accumulated and lain* for some time. The

Digitized by Google

bark of the tree is smooth, white, and deciduous each year. The wood is red in colour, weighs about 60lbs. per cubic foot, is admirably adapted for constructive works of all kinds, and resists the white ant and teredo as well as most timbers. In this State the tree is only found in such situations as those indicated, and, I understand, is not met with farther South than the Murchison River. I therefore do not consider it as one of the timber trees of Western Australia, and dismiss it with this short notice.

Yate Gum

(*Eucalyptus cornuta*).

This is not a very numerous member of our forests, but it still occupies a not inconsiderable place in the list of our valuable timbers. I have found the species here and there all over the Southern portion of the State, but always in small patches only. It seems to prefer, and delight in, the low-lying parts of the country where the soil is deep and fairly moist, such as along lake banks, claypans, and river depressions. There are some good specimens of the tree about "Lake Muir," and in the country lying between that and "Forrest Hill." In the hollows of the Wandoo country it is frequently met with. The bark is persistent, dark, rough, and rugged at bottom, but deciduous at top, leaving the branches white, like the Karri. The species is not, as a rule, a very large tree, but I have seen specimens 3ft. to 4ft. in diameter, and 40ft. to the first branch, the extreme height being about 80ft. In South Australia I experimented considerably with the tree, and found it easily raised from seed, a fast grower, a hardy species to deal with generally, and readily adapting itself to situations with an annual rainfall ranging from 15in. to 20in. In this tree we possess a most excellent timber, and one highly suited and used for shafts, spokes, naves, felloes, boat ribs, and agricultural implements generally. It is well worthy of cultivation.

Morrell Gum

(*Eucalyptus longicornis*).

A tree 50ft. to 60ft. in height, and from 12ft. to 18in. in diameter. It seems to prefer a loamy soil, and to be partial to soils of any kind which are good, strong, and have some body. The timber is hard, heavy, very strong in every way, especially in its lateral tension, and is of a dark reddish colour. For such works as general wheel manufacture, shafts, blocks, tool handles, mallets, and others requiring timber of a tough, strong, durable character, the Morrell timber is highly recommended. The leaves are especially rich in oil, the extraction of which would form an extremely profitable industry.

Red Flowering Mallee

(*Eucalyptus pyriformis*).

In my "Forest Flora of South Australia," this small tree, or shrub, is fully dealt with, described, and illustrated. The species *is practically a* Mallee only, and is here referred to purely on

Digitized by Google

account of the beauty and striking character of its flowers. These are large, spreading, and red in colour, and wonderfully handsome. So far as I am aware, it is only found in a dwarfed form in the interior upon the South Australian border. The calyx, or seed vessel, is unusually large and angular, and these characteristics formed the basis for the specific name.

Blackbutt

(*Eucalyptus patens*).

This tree is confined in its habitat to the South-Western portion of the State, and there only to the gullies and richer parts of it. It is specially abundant at Balbarrup, Dingup, and along the Blackwood River, especially from Bridgetown down to the Lower Blackwood. In the Blackwood gorge proper, the tree predominates above all others, and there grows to a large size.

As regards the timber, it is light in colour, hard, tough, and durable, and is used locally for such purposes as the construction of wheels, shafts, and farming implements generally. It is certainly a good timber as a whole, and is gradually taking a place in our local timber market. It appears to last well underground. An instance of this was shown me at Dingup, where slabs of the timber were used 20 years ago in the construction of a cattle yard, and these were quite sound when I saw them, with the exception of a little decay between wind and water. Another instance of its durability came under my observation at Deeside, where Mr. Muir showed me fence posts of the wood which had been in the ground for 50 years. Of course, as this tree is only found growing upon what may be described as the best land in the State, it is bound in time, as settlement develops, to become practically exterminated, or at least so far as to make it unavailable for marketable purposes to any appreciable extent. It is very difficult to split or burn, and hence is not looked upon with much favour by the settler, although always indicating rich soil. It is often to be met with 140ft. in height, and 4ft. to 7ft. in diameter. The bark is persistent, hard, deeply fissured, and dark grey in colour.

Blue Gum

(*Eucalyptus megacarpa*).

This is neither an important nor a numerous tree in the State and is therefore only referred to briefly here. I have seen it occasionally during my trip, but not very often. It occurs in small patches about Karridale, the Vasse, Mount Barker, on the Tone and Gordon Rivers, and on the sandalwood track between Bunbury and the Williams. The species is a fairly sized tree of about 70ft. in height, and from 1ft. to 3ft. in diameter, with a smooth, white, deciduous bark. The settlers do not use the wood for any particular purpose.

Flooded Gums of the South-West

(*Eucalyptus rudis and E. decipiens*).

These are not of any marketable importance. They inhabit the low-lying flats and banks of the rivers between the Swan and

Digitized by Google

the Blackwood, and are sometimes to be met with East of the Great Southern Railway. The timber of both is inferior, and altogether the trees have little or no commercial value.

Salmon-Barked Gum

(*Eucalyptus salmonophloia*).

A tree ranging from 40ft. to 70ft. in height, and 12in. to 30in. in diameter. Its name refers to the colour of the bark, which is of a reddish burnt appearance, fairly smooth, and somewhat persistent. The principal home of the tree is Eastward of the Darling Range, from the upper reaches of the Swan to the dry inland districts of the goldfields, and is found intermixed with the Morrell and Gimlet Gums. It is a common tree East of Newcastle, Northam, York, and along the Yilgarn, Midland, and Great Southern Railways. Along the Midland Railway the trees are of a fair size, and in several cases there the timber has been used with great success in the construction of bridges and culverts. The species prefers a good stiff loamy soil on top with a clay sub-soil. The timber is hard, heavy, and durable, and is used upon the goldfields for mining purposes.

Gimlet Gum

(*Eucalyptus salubris*).

This is intimately associated with the Salmon-Barked Gum, and the two together often form considerable areas of forest country. The name is derived from the strongly fluted or longitudinally twisted character of the outer surface of the stem of the tree. It is very peculiar in appearance, and is a unique and special feature of the species. It seems to prefer good retentive soils, and its chief habitat is in the dry country East of the Darling Range. It is a common member of the forests East of the Meckering Agricultural Area, and in the country lying along the route of the Yilgarn Railway, from which it spreads out North and South. There are patches of the tree at Carnamah, on the Midland Railway. With the Salmon-Barked Gum, it is found beyond the Coolgardie Goldfields. The timber is much of the same class as that of the Salmon-Barked Gum, and is in general use upon the goldfields.

Native Pine

(*Frenela verrucosa*).

These trees seem to crop up here and there in various parts of the State, but chiefly in the sandy and poorer portions of it. Of the various members of the family, the one in my list is the most important and the most widely distributed here, as well as all over the Continent of Australia. The timber of this species is of splendid grain, not readily, if at all, attacked by white ants, is hard, light in colour, has an agreeable scent, and weighs about 40lbs. per cubic foot. For house-building, where white ants are numerous, it is particularly well suited, as was found by the South Australian Government in the construction of the stations and other buildings *along the route* of the Port Darwin and Pine Creek Railway. It is

Digitized by Google

also suitable for furniture making, yokes, boat knees, walking sticks, door panels, wainscoting, and picture frames.

I have not seen it in the humid districts of the South-West, but on the Eastern sand plains and elsewhere in similarly dry and partially arid country it forms considerable belts.

Paper Barks

(*Melaleuca Leucadendron*).

A passing notice is all I can devote to these trees. There are several kinds in the State, and these are always met with in swamps, on river banks, and in the moist alluvial flats bordering the rivers, and all chiefly upon the sea coast. The bark, with its numerous layers of a paper-like consistency, is a marked peculiarity of the tree, and for packing fruit for export should be well suited. The timber is hard, durable, cross-grained, lasts well underground, and resists the white ants. It is not much used here, but is available for ship-building, posts, short piles, and fencing.

According to detailed inspection by me, the areas occupied by the respective principal trees of Western Australia are as follow:—

	Acres.
Jarrah (with Blackbutt and Red Gum) ...	8,000,000
Karri	1,200,000
Tuart	200,000
Wandoo	7,000,000
York Gum, Yate, Sandalwood, and Jam ...	4,000,000
Total area of the principal Forest surface of Western Australia	20,400,000

As to the estimated quantities and values of the matured marketable timbers now standing in the forests of Western Australia, I must speak with a considerable amount of diffidence; not diffidence in exactly the literal meaning of the word, but rather with a certain feeling of caution and hesitancy in approaching such a comprehensive and important matter. However, whatever be the general verdict upon my figures and deductions, I am assured in my own mind that they are fairly correct and may be accepted as a reliable approximation of what they purport to be. I desire it to be distinctly understood that the estimate of quantities has reference only to those large trees which are at the present time sufficiently matured to be available for sawmill purposes, and which are at that stage of growth when they should be removed in order to make room for the development of the young crop coming on. In no sense, therefore, do these figures refer in any way to the permanent value of the forests, but only to the crop of trees which is now available for utilisation. I have based my calculations in this section upon what I consider the trees contain of round timber suitable for the mill. There is no doubt that our timbers must at present be cut *to suit market requirements*, without reference

Digitized by Google

consideration of the proper and most profitable utilisation of the timber. This is one of the disadvantages attending the present market for our timber, but it is one which will, no doubt, gradually remedy itself.

To give an idea of the waste, unavoidably as well as carelessly, which goes on, I should think that something like two-thirds only of the timber in the trees are utilised. It therefore follows that the realised output from the sawmills of marketable stuff is not so much as it would be were we in a position to command a market for general timber merchandise.

With these few preliminary remarks I now submit the following as my estimate of the matured timber at present growing in the forests situated upon the Crown Lands of the State:—

	Loads.
Jarrah	40,000,000
Karri	15,000,000
Tuart	300,000
Wandoo, York Gum, Yate, Blackbutt ...	7,000,000
Estimated total loads of round matured timber now in the Forests of Western Australia	62,300,000

This immense quantity is, I believe, considerably under what actually exists. I think that we may safely look upon this timber as worth to the country 60s. per load; this representing the average amount which is retained in the State for wages, haulage, trainage, loading on board ship, and profit now obtained by those employed in the trade.

Such being the case, we find that the marketable timber now growing in the forests of Western Australia is worth, deducting one-third for waste in sawing, no less a sum than, in round numbers, £124,000,000. No estimate is here made of the Red Gum.

In taking a glance at the prospective value of the Western Australian forests, this must be gratifying to all concerned, and is certainly encouraging to those who will have the privilege and honour of instituting such a complete modern system of forestry in the State as will entitle these forests to be recognised as one of the most important and reliable resources of the country. It is easy, of course, to make a statement of this kind, but to carry out such a system successfully will be found to be a work fraught with difficulties, vexations, and disappointments. Yet I maintain that all these can be, and ought to be, overcome in the interests of the country generally. It only wants a wise administrative power and a strong Government to bring about what is here indicated. The value of these extensive Jarrah and Karri forests is now beginning to be recognised; they are not now looked upon as a nuisance and hindrance to settlement, as they were some years ago. The progress of events has entirely *changed the* aspect of the timber question, and where years ago

Digitized by Google

forest areas could be obtained for almost nothing, these are now eagerly sought after at fair prices. The individual who possesses a bit of good forest land may consider himself fortunate in having this capital at his back. A beginning only has yet been made in what may be described as the timber industry, but even the operations now going on in the forests give us an idea as to what magnitude they will assume if fostered and encouraged.

We have seen that there are something like 60,000,000 loads of matured timber now in our forests. This timber is ripe and should be removed to make way for succeeding crops. It will take many generations to cut out the Karri and Jarrah timber which is now at our disposal.

I think I am considerably within the mark when I state that the forests of this State are capable of supporting, and keeping in full working order, a mill power and staff at least five times as large as what we now possess.

PART III.—GOVERNMENT.

1.—THE COMMONWEALTH AND THE STATE.

Since the 1st January, 1901, Western Australia has become one of the Federated Australian States. The idea of a United Australia was suggested by Earl Grey so far back as 1847. The scheme was then strenuously opposed even by the colonies themselves, the time for an amalgamation of their respective interests evidently not being yet ripe, although the question of a uniform tariff was, then and after, frequently discussed by colonial statesmen, and though for more than thirty years Federation was repeatedly made the special object of intercolonial conferences. A Bill embodying a scheme for carrying out the idea was framed by Sir Henry Parkes in 1881, but did not gain the concurrence of the other leading politicians. In 1883 Sir Samuel Griffith drafted the Bill which, in 1885, created the Federal Council. The members of that Council met for the first time in 1886, at Hobart. But the plan of Federation which it was intended to carry out did not satisfy Sir Henry Parkes, as it did not go far enough in the direction of unifying the interests of the colonies. He therefore initiated a more comprehensive rival scheme, and, throwing all the weight of his personal influence into the scale, gained that popular approval for his ideas which alone could secure success, and the lack of which doomed the other movement to failure. *A Federation Conference took* place in Melbourne

February, 1890, and was attended by Sir Henry, whose far-reaching proposals triumphed over the more timid intentions of the Federal Council. A resolution was carried to the effect that, in the opinion of the Conference, the best interests and the present and future prosperity of the Australian colonies would be promoted by an early union under the Crown; and that the members of the Conference should take steps to induce their respective legislatures to appoint, during that year, delegates, not exceeding seven in number from each colony, empowered to consider and report upon an adequate scheme for a federal constitution. In consequence of this resolution, the first Federal Convention met in Sydney in March, 1891. Both at the Melbourne Conference and at the Sydney Convention Western Australia was represented. But although favouring the general idea of Federation, her leading politicians realised that her position as the least populous colony required the most careful consideration in any scheme of union, lest she might jeopardise her commercial interests by binding herself to uniform legislation in matters of trade. Before this, in Melbourne, in 1890, Sir James Steere had expressed his doubt whether his colony could afford to sacrifice her provincial tariff. The Western Australian representatives at the Sydney Convention in 1891 were: Mr. John Forrest, Mr. W. E. Marmion, Sir James G. Lee Steere. Mr. J. A. Wright, Mr. J. W. Hackett, Mr. A. Forrest, and Mr. W. T. Loton. A Bill was drafted by this Convention on lines which have since been adopted as the basis of all the subsequent stages of the movement. Unfortunately, however, members failed to come to an agreement with regard to the fiscal policy to be established. The difference of population, of the economical conditions prevailing in the various colonies, and of the systems of a more or less protectionist or free trade character consequently favoured by their respective delegates, made a reconciliation of opinions almost impossible for the time being, and for a while it seemed as if the Convention would have no results. In 1893, however, another meeting, that of the "Federation Council," took place at Hobart, which paved the way for a conference of the Premiers in the same city two years later. At this conference it was decided to take steps at once to call a convention chosen directly by the electors, for the purpose of framing the Federal Constitution. With this resolution Sir John Forrest, then Premier of Western Australia, disagreed, holding that the draft Commonwealth Bill of 1891 should be first considered by the Parliaments of the various colonies, and any amendments made by them referred to a second convention, to be appointed after a general election. Western Australia, however, fell partially into line with the movement, and on the 27th October, 1896, her Government passed an Enabling Act, by which her representatives were to be elected by the two Houses of Parliament sitting together. Her ten representatives to the Convention of 1897, which commenced its sessions in Adelaide in March, were the Hon. Sir John Forrest, K.C.M.G., M.L.A. (Premier); the Hon. Sir James G. L. Steere (Speaker); Mr. G. Leake, *M.L.A. (Leader* of the Opposition); the Hon. F. H. Piesse, M.L.A.

Digitized by Google

(Commissioner of Railways); the Hon. J. W. Hackett, M.L.C.; Mr. W. T. Loton, M.L.A.; Mr. W. H. James, M.L.A.; Mr. A. Y. Hassell, M.L.A.; Mr. R. F. Sholl, M.L.A.; and the Hon. J. H. Taylor, M.L.C. The Convention at once applied itself to drafting a Bill to provide for the Federal Constitution. In this Bill a basis was fixed for distributing the surplus revenue of the Commonwealth under the following three periods: (1.) Before the imposition of uniform duties; (2.) for five years after the imposition of uniform duties; (3.) subsequently. For these three periods the distribution agreed upon was as follows:—(1.) During the first period, that is while the provincial tariffs remained in force, each State was to be credited with the revenue collected in it from Customs and Excise duties, and the performance of the services transferred to the Commonwealth. Each State was to be debited with the expenditure of the Commonwealth in respect of these duties and services, and also with a share upon a population basis of the expenditure of the Commonwealth in the exercise of its original powers, the balance then due to each State to be paid monthly. (2.) During the first five years after the imposition of uniform duties, expenditure was to be charged in the same way, and revenue was still to be credited to each State on the basis of its contributions. But as with a federal tariff and intercolonial free-trade, the State in which Customs duty was paid would not necessarily be the State in which the dutiable article was consumed, it was provided that, notwithstanding the abolition of intercolonial tariffs, an account should be kept of imported dutiable articles passing from one State to another, and the duty chargeable thereon should be credited to the consuming State, and not to the State in which the duty was collected. (3.) After that period, all expenditure was to be charged, and all surplus revenue distributed monthly, in proportion to population. On the 22nd of April the Convention was adjourned till the 5th of May, and from that day further till the 2nd September, when the delegates met again in Sydney. Meanwhile the Western Australian Parliament met on the 17th August, and its consideration of the draft Bill led to the formulation of a few amendments. Both Houses asked for a guarantee in respect of the return of surplus revenue to each individual State, and struck out the sliding scale of distribution; whilst for the ultimate basis of distribution the Assembly rejected the *per capita* system in favour of a return in proportion to contributions. The Assembly also proposed to charge the Commonwealth with a proportion of the liabilities on the basis, not of population, but of adult male population. At the Sydney session of the Convention the places of Messrs. Piesse, Loton, Sholl, and Taylor were taken by the Hons. H. Briggs, M.L.C.; F. T. Crowder, M.L.C.; A. H. Henning, M.L.C.; and H. W. Venn, M.L.C. During the discussions it became evident that the opinions, according to the varying interests of the different colonies, were still widely divergent. "At one end of the scale," to quote a well-known account of the proceedings,* "stood New South Wales, with a purely freetrade

* "The *Annotated Constitution of the Australian Commonwealth*," by John C *LL.D., and R. R. Garran, M.A.*

Digitized by Google

tariff and a large land revenue; what she feared was, not a deficiency of revenue for provincial purposes, but an unduly large increase of taxation through the Customs. At the other end of the scale stood Western Australia, with a large, unsettled, mining population, and relying almost entirely on Customs duties, a great proportion of which were collected on intercolonial produce. It was recognised that her abnormal position required special treatment, and that no system of general application could meet her needs." The discussions resulted in the opinion that a basis of experience was necessary to guide the future legislators of the Commonwealth in their decisions on this difficult subject, as the conclusions arrived at by statisticians and actuaries were of a somewhat contradictory nature. In the end, indeed, it was left to a Finance Committee to suggest a solution of the problem. On the 24th September the Convention adjourned, to meet for its final session in Melbourne on the 20th January, 1898. This session extended to the 17th March. The Finance Committee recommended the adoption of the system of "book-keeping" already suggested, for five years and thereafter until the Parliament "should otherwise provide." In other words, the plan proposed was that of 1891, which ensured to each State a return of the surplus revenue on the basis of its contributions for five years, leaving the ultimate mode of distribution to be determined by the Parliament. To meet the case of Western Australia, a clause was proposed providing that in the event of a falling off in the proportional amount collected in that colony, as compared with the rest of the Commonwealth, such deficiency should be made good by the Commonwealth. This, however, was not agreed to, but it was decided that Western Australia should be allowed for five years to impose gradually diminishing duties on intercolonial imports. The Draft Bill having been adopted by the Convention, it was at once arranged to submit it to a referendum of the several colonies concerned. In Victoria, South Australia, Queensland, and Tasmania decisive majorities in favour of the Bill were obtained, but in New South Wales the requisite minimum was not attained, whilst the Western Australian Government held aloof for the time being from the movement. At Mr. Reid's request, the Premiers of the six colonies met again in Melbourne on the 29th January, 1899, when Sir John Forrest unsuccessfully asked for certain concessions to be made to his colony. Some amendments were then introduced into the Draft Bill, which satisfied the people of New South Wales, and a second referendum being taken in that colony, the adoption of the Bill was secured. In July, 1899, the Draft Constitution Bill was submitted to the Western Australian Parliament, and referred to a Select Committee of the Legislative Assembly. This committee, on the 19th September, reported that before the Colony could safely join the Commonwealth, four amendments in the Constitution Bill were necessary: (1.) That the Colony should be enabled to divide itself into electorates for the election of Senators; (2) That the Federal Parliament should be empowered to authorise the construction of a transcontinental railway; (3) That for five years after the adoption

Digitized by Google

of the Federal Tariff Western Australia should be allowed to impose her own Customs duties on intercolonial and other imports; (4) That Western Australia should be exempted for five years from the jurisdiction of the Interstate Commission. The Government then proposed to submit to the electors both the Bill as adopted by the Premiers' Conference, and the Bill with the Western Australian Amendments, and this proposal was carried by the Legislative Assembly. In the Legislative Council, however, no agreement of any kind was arrived at, and thus the submission of the Bill to the people was for the time being postponed. On this an agitation was almost immediately commenced on the Goldfields to obtain a separation from the parent Colony for the Goldfields and other districts, with a view to forming a new colony which would be enabled to join the Commonwealth. The movement began with a meeting at Kalgoorlie on the 3rd of January, 1900, when a resolution was passed that a petition should be presented to Her Majesty the Queen praying her to exercise the prerogative of the Crown, under which power is given to divide any colony where necessary, and to grant a separate Government to those districts which wished to secede from the parent Colony. Sir John Forrest attended the conference of Premiers in Sydney on the 24th of January, 1900, where, after some discussion, he relinquished three of the amendments, but insisted on retaining the one which provided for five years' liberty to impose intercolonial Customs duties. The fact, however, that the constitution was now a compact, to the terms of which the people of five colonies had given their approval, prevented the other Premiers from considering the possibility of making the desired concession. In the meantime, the scheme of federation had been placed before the Imperial Government, and on the 22nd of December, 1899, Mr. Chamberlain, the Secretary of State for the Colonies, in a telegraphic despatch to Earl Beauchamp, the Governor of New South Wales, had expressed the hope that delegates from each of the colonies which desired to federate would visit England, and be present when the Commonwealth Bill was submitted to the Imperial Parliament. This proposal was duly discussed at the Premiers' conference, and it was arranged that Mr. Edmund Barton (N.S.W.), Mr. Alfred Deakin (Vic.), Mr. J. R. Dickson (Q.), and Mr. C. C. Kingston (S.A.), should proceed to London, where Sir Philip O. Fysh (Tas.) was to join them. The Government of Western Australia expressed a desire to be also represented, and, with the concurrence of the Secretary of State, despatched Mr. S. H. Parker, Q.C., who left for England on the 18th February. On the 27th March Mr. W. P. Reeves, the Agent General for New Zealand, informed the colonial office that he had been appointed a delegate for that colony, and on the 30th March he forwarded a memorandum of amendments desired by New Zealand. On the same day Mr. Parker forwarded to the Colonial Office a memorandum of the amendment asked for by his Colony, namely that Western Australia should be empowered, for five years after the adoption of the Federal tariff, to receive the same Custom duties as were in force at the passing of the Commonwealth Act, such

Digitized by Google

against. The following tables give complete particulars of the voting in Western Australia, and an analysis of the entire vote of Australasia on Federation :—

Particulars of the Polling at the Referendum held on the 31st July, 1900, pursuant to "The Australasian Federation Enabling Act, 1900."

Electoral District.	No. of Persons who Voted.			No. of Votes Cast.		Majority.		Informal Votes.
	Males.	Females.	Total.	For.	Against.	For.	Against.	
Albany	569	412	981	914	67	847	...	11
Ashburton	90	6	96	60	36	24	...	1
Beverley	330	171	501	86	415	...	329	7
Bunbury	799	496	1,295	493	802	...	309	5
Canning	597	317	914	405	509	...	104	8
Coolgardie	3,312	1,191	4,503	4,337	166	4,171	..	28
Coolgardie, East ...	10,381	1,853	12,234	11,502	732	10,770	...	63
Coolgardie, North ...	2,306	489	2,795	3,715	117	3,598	...	44
Coolgardie, N'th-East	3,298	534	3,832	2,655	140	2,515	...	19
DeGrey	90	5	95	80	15	65	...	4
Dundas	646	200	846	816	30	786	...	11
Fremantle	627	182	809	532	277	255	...	4
Fremantle, East ...	1,342	784	2,126	1,322	804	518	...	18
Fremantle, North ...	1,177	790	1,967	1,289	678	611	...	21
Fremantle, South ...	2,021	905	2,926	1,544	1,382	162	...	16
Gascoyne	105	38	143	66	77	...	11	...
Geraldton	606	327	933	254	679	...	425	13
Greenough	244	185	429	18	411	...	393	5
Irwin	214	130	344	34	310	...	276	1
Kimberley, East ...	57	4	61	60	1	59	...	...
Kimberley, West ...	115	16	131	97	34	63	...	1
Moore...	328	200	528	65	463	...	398	2
Murchison	167	89	256	27	229	...	202	1
Murchison, Central...	676	166	842	777	65	712	...	4
Murchison, North ...	638	42	680	597	83	514	...	7
Murchison, South ...	1,073	154	1,227	1,008	219	789	...	26
Murray	814	329	1,143	469	674	...	205	17
Nelson	688	201	889	402	487	...	85	10
Northam	994	432	1,426	593	833	...	240	17
Perth	2,718	996	3,714	2,386	1,328	1,058	...	21
Perth, East	1,162	786	1,948	1,128	820	308	...	17
Perth, North... ...	1,380	880	2,260	1,416	844	572	...	22
Perth, West	2,388	1,078	3,466	2,078	1,388	690	...	31
Pilbara	313	4	317	308	9	299	...	3
Plantagenet	508	166	674	447	227	220	...	5
Roebourne	98	18	116	98	18	80	...	...
Sussex	469	251	720	246	474	...	228	7
Swan	1,163	593	1,756	852	904	...	52	16
Toodyay	402	251	653	75	578	...	503	3
Wellington	942	334	1,276	581	695	...	114	20
Williams	690	273	963	214	749	...	535	9
Yalgoo	218	51	269	155	114	41	...	3
Yilgarn	496	102	598	460	138	322	...	3
York	480	329	809	139	670	...	531	15
Total	47,731	16,760	64,491	44,800	19,691	25,109	...	539

Digitized by Google

Analysis of the Vote of Australasia on "The Australasian Federation Enabling Act, 1900."

(Compiled by the Officer in Charge of Electoral Matters.)

Name of Colony.	Commonwealth Referendum.				Approximate number of persons qualified to vote.	Percentage of Votes recorded to total number of persons qualified to vote (exclusive of informal votes).		
	Date.	Yes.	No.	Total.		Yes.	No.	Total
						%	%	%
New South Wales	20-6-1899	107,420	82,741	190,161	300,000	35·81	27·58	63·39
Victoria	27-7-1899	152,653	9,805	162,458	288,600	52·89	3·40	56·29
Tasmania	27-7-1899	13,437	791	14,228	39,002	34·45	2·03	36·48
South Australia, Province ...	29-4-1899	65,990	17,053	83,043	152,554	43·26	11·18	54·44
Do. Northern Territory	6-5-1899							
Queensland	2-10-1899	38,488	30,996	69,484	107,265	35·88	28·90	64·78
Western Australia	31-7-1900	44,800	19,691	64,491	96,065	46·63	20·50	67·13
Total	...	422,788	161,077	583,865	983,486	42·99	16·38	59·37

And thus Western Australia having decided to throw in her lot with the other Colonies, the Commonwealth union became an established fact. Sir John A. Cockburn, one of the most ardent advocates of federation, has summarised the functions of the Commonwealth in the following words:—"The ruling principle on which the allocation of powers has been conducted is to vest in the central authority those functions only which are incapable of individual exercise, and for whose efficient performance joint action is necessary. External relations are regarded as essentially of federal concern; so that though there may be many voices as between the States, the pronouncement of the Commonwealth shall be definite and coherent." And further: "Absolute freedom of trade is secured by the inclusion of trade and commerce. This is the goal towards which the federal efforts of the past ten years have been chiefly directed." The principal matters with which the Commonwealth has power to deal are naval and military defence, quarantine, lighthouses, naturalisation, immigration, postal, telegraphic, and telephonic services, currency and coinage, insolvency, patents, copyrights, marriage, census and statistics, astronomical and meteorological observations, etc. As regards the much-discussed transcontinental railway, Sir John Cockburn says: "The construction of an overland communication is a necessity, both from the points of view of internal development and common defence." Already the Government has taken a practical step towards the realisation of this scheme, by having a flying survey made of the country through which the railway route will most probably lie.

The date selected for the establishment of the Commonwealth was the 1st of *January, 1901.* On the 2nd December, 1900,

Digitized by Google

Lord Hopetoun, the Governor General elect of the federated States, arrived in Australia, and the inauguration of the union took place in Sydney on the first day of the new century. It had been officially announced on the 17th September, 1900, that the Queen, on the recommendation of Lord Salisbury, had assented to a visit by the Duke and Duchess of York to Australia early in 1901, when the Duke of York would be commissioned by Her Majesty to open the first session of the Commonwealth Parliament in her name.

It now remained to take those steps which were necessary to carry out the measures laid down in the Constitution. The management of the federal Customs was taken over from the States on the 1st of January, 1901. The Postal and Telegraphic and Defence Departments followed on the 1st of March. Mr. Barton, who formed the first Federal Ministry, asked Sir John Forrest to join him as Postmaster General. Afterwards, however, Sir John was offered the portfolio of Defence, and on the 1st of March he assumed the control of the Australian Defence Forces. The election of members of the two Houses of the Commonwealth Parliament took place in March. Each of the six States is represented by six senators in the Upper House, the State forming in each instance a single electoral district. The following gentlemen were elected by the people of Western Australia as their representatives in the first Federal Senate:—

De Largie, Hugh, Esq.
Ewing, Norman Kirkwood, Esq.
Harney, Edward Augustine, Esq.
Matheson, Alexander Perceval, Esq.
Pearce, George Foster, Esq.
Smith, Miles Staniforth Cater, Esq.

The House of Representatives consists of 75 members, five of whom are sent by Western Australia. Under the provisions contained in 64 Victoriæ, No. 6, this State was divided into the following five electorates for the purpose of the Federal elections:—

1. Coolgardie, comprising the following ordinary electoral districts:—Coolgardie, Cue, East Kimberley, West Kimberley, Mount Burges, Mount Magnet, Mount Margaret, Menzies, North Murchison, Pilbara, and Yilgarn.
2. Fremantle, comprising Claremont, Cockburn Sound, Fremantle, East Fremantle, North Fremantle, South Fremantle, Murray, and South Perth.
3. Kalgoorlie, comprising Boulder, Dundas, Hannans, Kalgoorlie, and Kanowna.
4. Swan, comprising Albany, Beverley, Bunbury, Gascoyne, Geraldton, Greenough, Irwin, Moore, Murchison, Nelson, Northam, Plantagenet, Roebourne, South-West Mining, Sussex, Swan, Toodyay, Wellington, Williams, and York.
5. Perth, comprising Guildford, Perth, East Perth, North Perth, West Perth, and Subiaco.

Digitized by Google

The representatives elected for this State were:—

Forrest, Rt. Hon. Sir John, P.C., G.C.M.G., Minister of State for Defence	Swan
Fowler, James Mackinnon, Esq.	Perth
Kirwan, John Waters, Esq.	Kalgoorlie
Mahon, Hugh, Esq.	Coolgardie
Solomon, Elias, Esq.	Fremantle

The electors entitled to vote for the Federal Parliament are the same as those on the electoral rolls for the State Legislative Assembly, with the understanding, however, that no elector is entitled to vote more than once.

The Senate is elected for a period of six years, the House of Representatives for three years.

The qualifications of a Senator or of a member of the House of Representatives are as follow:—

1. He must be of the full age of twenty-one years, and must be an elector entitled to vote at the election of members of the House of Representatives, or a person qualified to become such elector, and must have been for three years at the least a resident within the limits of the Commonwealth as existing at the time when he is chosen:

2. He must be a subject of the King, either natural-born or for at least five years naturalised under a law of the United Kingdom, or of a Colony which has become or becomes a State, or of the Commonwealth, or of a State.

Any person who—

1. Is under any acknowledgment of allegiance, obedience, or adherence to a foreign power, or is a subject or a citizen, or entitled to the rights or privileges of a subject or a citizen of a foreign power; or

2. Is attainted of treason, or has been convicted and is under sentence, or subject to be sentenced, for any offence punishable under the law of the Commonwealth or of a State by imprisonment for one year or longer; or

3. Is an undischarged bankrupt or insolvent; or

4. Holds any office of profit under the Crown, or any pension payable during the pleasure of the Crown out of any of the revenues of the Commonwealth; or

5. Has any direct or indirect pecuniary interest in any agreement with the public service of the Commonwealth, otherwise than as a member and in common with the other members of an incorporated company consisting of more than twenty-five persons;

is incapable of being chosen or of sitting as a senator or as a member of the House of Representatives.

On the 9th of May, the Commonwealth Parliament was opened in Melbourne by the *Duke of York*. Their Royal Highnesses the

Digitized by Google

Duke and Duchess of York subsequently, on their return voyage, visited Western Australia, where they arrived on the 20th July, and received an enthusiastic welcome, the celebrations extending over a whole week.

The Governor General of the Commonwealth, the Right Honourable the Earl of Hopetoun, G.C.M.G., visited Western Australia for the first time in December, 1901.

2.—GOVERNORS OF WESTERN AUSTRALIA.

The following is a list of the Governors and Acting Governors of Western Australia, with the dates of their assumption of and retirement from Office :—

Name.	From	To
Captain James Stirling, R.N., Lieut.-Governor, Commander-in-Chief, and Vice-Admiral	30th Dec., 1828a	Sept., 1832
Captain Frederick Chidley Irwin, Lieut.-Governor, etc.	Sept., 1832 ...	Sept., 1833
Captain Richard Daniell, Lieut.-Governor, etc.	Sept. 14, 1833...	May, 1834
Captain Picton Beete, Lieut.-Governor etc.	May 11, 1834 ...	May, 1834
Captain Richard Daniell, Lieut.-Governor, etc.	May 24, 1834 ...	Sept., 1834
Captain Sir James Stirling, Governor, etc.	Sept. 19, 1834...	Jan., 1839
John Hutt, Esq., Governor, etc.	Jan. 3, 1839 ...	Jan., 1846
*Lieut.-Colonel Andrew Clarke, K.H., Governor, etc.	Jan. 27, 1846 ...	Feb., 1847
Lieut.-Colonel Frederick Chidley Irwin, Governor, etc.	Feb. 12, 1847 ...	Aug., 1848
Captain Charles Fitzgerald, R.N., Governor, etc.	Aug. 12, 1848...	July, 1855
Arthur Edward Kennedy, Esq., Governor, etc.	July 23, 1855...	Feb., 1862
Brevet-Lieut.-Colonel Jno. Bruce, Acting-Governor, etc.	Feb. 20, 1862...	Feb., 1862
John Stephen Hampton, Esq., Governor, etc.	Feb. 28, 1862...	Nov., 1868
Lieut.-Colonel Jno. Bruce, Acting Governor, etc.	Nov. 2, 1868 ...	Sept., 1869
Frederick Aloysius Weld, Esq., Governor and Commander-in-Chief	Sept. 30, 1869...	Jan., 1875
William Cleaver Francis Robinson, Esq., C.M.G., Governor, etc.	Jan. 11, 1875 ...	Sept., 1877

a. Letter of Appointment issued 30th Dec., 1828; first Commission granted 4th March, 1831. * Died, 11th February, 1847.

Digitized by Google

GOVERNORS OF WESTERN AUSTRALIA—*continued.*

Name.	From	To
Lieut.-Colonel Edward Douglas Harvest, Acting Governor, etc.	Sept. 7, 1877 ...	Nov., 1877
*Major-General Sir Harry St. George Ord, R.E., K.C.M.G., C.B., Lieut.-Governor, etc.	Nov. 12, 1877...	April, 1880
Sir William Cleaver Francis Robinson, K.C.M.G., Governor, etc.	April 10, 1880	Feb., 1883
Henry Thomas Wrenfordsley, Esq., Administrator, etc....	Feb. 14, 1883...	June, 1883
Sir Frederick Napier Broome, K.C.M.G., Governor, etc.	June 2, 1883 ...	Nov., 1884
Alexander Campbell Onslow, Esq., Administrator, etc....	Nov. 13, 1884...	June, 1885
Sir Frederick Napier Broome, K.C.M.G., Governor, etc.	June 16, 1885...	Dec., 1889
Sir Malcolm Fraser, K.C.M.G., Administrator, etc.	Dec. 21, 1889 ...	Oct., 1890
Sir William Cleaver Francis Robinson, G.C.M.G., Governor, etc.	Oct. 20, 1890 ...	Sept., 1891
Alexander Campbell Onslow, Esq., Administrator, etc.	Sept. 21, 1891 ...	July, 1892
Sir William Cleaver Francis Robinson, G.C.M.G., Governor, etc.	July, 9, 1892 ...	March, 1895
Sir Alexander Campbell Onslow, Kt., Administrator, etc.	March 18, 1895	23rd Dec., 1895
Sir Gerard Smith, K.C.M.G., Governor, etc.	Dec. 23, 1895...	June, 1900
Sir Alexander Campbell Onslow, Kt., Administrator, etc.	March 23, 1900	March, 1901
Edward Albert Stone, Esq., Administrator, etc.	March 4, 1901	April, 1901
Hon. Sir Arthur Lawley, K.C.M.G., Governor, etc.	May 1, 1901 ...	†

3.—EARLY CONSTITUTION.

Captain Stirling, the Superintendent of the First Colonising Expedition, was, before leaving England in February, 1829, appointed Lieutenant-Governor, although no commission was actually issued to him until the 4th March, 1831; a promise was made that a Bill would be submitted to Parliament to make provision for the Civil Government of the New Settlement, which promise was duly fulfilled, when, on the 14th May, 1829, The 10th George IV., No. XXII., "*An Act to provide until the thirty-*

* Appointed Governor and Commander-in-Chief, 30th January, 1878.

† *See* note † on page 381.

Digitized by Google

"*first day of December, 1834, for the Government of His Majesty's* "*Settlement in Western Australia, on the Western Coast of New* "*Holland,*" received the Royal assent.

The following is a list of the names of the first Officials appointed:—

Secretary to Government	Peter Brown.
Surveyor	John Septimus Roe, Lt., R.N.
Assistant Surveyor	H. C. Sutherland.
Harbour Master	Captain Mark Currie, R.N.
Deputy Harbour Master and Pilot ...	Daniel Scott.
Superintendent of Government Farms, Gardens, and Plantations	James Drummond.
Superintendent of Government Stock	George W. Mangles.
Storekeeper	John Morgan.
Civil Engineer	H. W. Reveley.
Registrar	William Stirling.
Surgeon	Charles Simmonds, M.D.

On the 8th June, 1829, the Lieutenant-Governor issued a warrant for the establishment of a Board of Commissioners, who should examine into and report upon such matters as might be referred to it relative to the management of the property of the Crown, and of public property within the settlement; and for the purpose of auditing and passing all public accounts; and for the purpose of demanding, receiving, and duly apportioning all fines, fees, forfeitures, accruing or becoming due to the Government, which board, as first constituted, consisted of Captain Mark J. Currie, as Presiding Commissioner; and Commissioners Lieutenant J. S. Roe and Mr. William Stirling, the latter acting as Secretary *pro tem.*; it was called the Board of Council and Audit, and provision was made for the number of Commissioners being increased as circumstances might make it necessary.

On the 18th June, 1829, a Proclamation was issued stating that, possession having been taken of the territory, and settlement being actually effected, all persons were required to regulate their conduct with reference to His Majesty's authority represented in the Governor, and to obey all such legal commands and regulations as he might from time to time see fit to enact; and, further, that by the establishment of the Royal authority, the territory became subject to the laws of the United Kingdom, as far as they were applicable to the circumstances of the case.

The Proclamation made provision for the appointment of a Sheriff and his officers, and also of Justices of the Peace.

Notice was given that persons behaving in a fraudulent, cruel, or felonious manner towards the aboriginal natives were, on conviction, liable as if the same had been committed against any other of His Majesty's subjects.

Compulsory service in the Militia for all males between the ages of 15 and 50 was commanded.

The conditions under which lands could be obtained were to be exhibited at the offices of the Secretary to Government and *Surveyor General.*

Digitized by Google

And, further, all persons were required, as soon as practicable after their arrival in the settlement, to obtain permission to reside there, as persons residing in the settlement without permission rendered themselves liable to be committed to custody; and no persons were allowed to quit the settlement without giving a week's notice of their intention to do so.

Executive Council.

By an Order in Council, dated the 1st November, 1830, the first Executive Council was constituted.

The Order set forth "That the Governor for the time being "of the said Settlements of Western Australia, or the Officer "administering the Government thereof, the Senior Officer of His "Majesty's Land Forces next in command, the Colonial Secretary "of the said Territory for the time being, the Surveyor General "thereof for the time being, and the Advocate General thereof "for the time being, so long as they shall respectively be resident "in the said Settlements, or any three of them, of whom the Acting "Governor shall be one, shall have authority and power to make, "ordain, and establish all such Laws and Ordinances, and to con-"stitute such Courts and Officers as may be necessary for the peace, "order, and good government of His Majesty's subjects, and others "within the Settlements," subject, however, to the Royal prerogative of disallowance; and the Order went on to state, "that no such "Law or Ordinance shall be made unless the same shall have been "first proposed by the said Governor or Officer administering the "Government"; and, further, that no Court of Justice was to be constituted, except by a Law or Ordinance which had received the Royal assent.

The first Executive Council appointed consisted of—

Captain James Stirling, R.N. (Governor)	President.
Captain Frederick Chidley Irwin ...	Commandant.
Peter Brown	Colonial Secretary.
John Septimus Roe, Lt., R.N. ...	Surveyor General.
George Fletcher Moore ...	Advocate General.

In the constitution of the Executive Council, as set forth in the Order in Council of November, 1830, no change took place until June, 1847, when, under the authority of a Royal Order in Council, the Collector of Revenue was appointed an Executive officer.

On the 5th of June, 1852, it was officially notified that Her Majesty the Queen had been graciously pleased to appoint the Comptroller General of Convicts to be a member of the Executive.

In 1855, as the Royal instructions to Governor Kennedy did not include the senior officer in command of the troops as a member of the Executive Council, Lieutenant-Colonel Bruce, who at the time held that appointment, ceased to hold office from the 21st July; but, the omission having been rectified, he was re-appointed a member on the 28th December in the same year.

By Order of the Queen in Council, dated 3rd April, 1871, the Executive Council was remodelled. The Governor remained Pres-

Digitized by Google

dent, the Colonial Secretary, the Attorney General, the Senior Officer in command of the Land Forces, and the Surveyor General retained their seats, whilst those of the Comptroller General and Collector of Revenue were abolished.

Under the Royal Instructions of 4th July, 1878, the Governor was further authorised and empowered "to appoint, in addition to the *ex officio* members, such persons as he may think fit to be Unofficial Members of our said Executive Council, but so that the number of such Unofficial Members shall never exceed the number of two." Every such appointment was, however, to be provisional only until the same was approved of by the Queen, and could be revoked at any time by Royal Warrant, and such Unofficial Members were to take rank after the Official Members of the Executive Council, and as between themselves, according to the order of their appointment.

The Governor was also directed and enjoined to attend and preside at the meetings of the Council unless prevented by some necessary or reasonable cause, when, unless he specially appointed some particular member, the Senior Member present was to preside.

In February, 1879, Mr. J. H. Thomas, who then held the position of Director of Public Works and Commissioner of Railways, was provisionally appointed an unofficial member of the Executive, the appointment being changed to that of an official member during the following May.

By the additional Royal Instructions of the 8th April, 1879, it was laid down that the Executive Council was to comprise "so many persons in Our Service (not exceeding six in number at any one time) as the Governor shall from time to time appoint to be members of the said Council by Instruments under the Public Seal of the Colony. All such persons shall be styled Official Members, and the persons discharging the functions of the offices hereunder mentioned shall, if so appointed, take precedence and seniority in the order in which the said officers are named; that is to say: —

Colonial Secretary.
Attorney General.
Senior Military Officer in Command of Our Troops within the Colony, not being below the rank of Lieutenant-Colonel.
Treasurer and Collector of Internal Revenue.

Official members discharging the functions of any other offices shall take precedence and seniority after the foregoing officers, and amongst themselves according to the date of their respective appointments."

The section of the original Instructions of the 4th July, 1878, relating to the appointment of two "Unofficial Members" still remained in force.

The officers first appointed were:—

The Governor (President).
The Colonial Secretary.
The Attorney General.
The Senior Military Officer Commanding Her Majesty's Troops.
The Surveyor General and Commissioner of Crown Lands.
The Director of Public Works and Commissioner of Railways.

Digitized by Google

On the 3rd November, 1879, the officer holding the appointment of Colonial Treasurer and Collector of Internal Revenue was appointed to a seat as an official member of the Council.

Since 1880, when Lieut.-Colonel E. D. Harvest left the Colony, the office of Commandant was not represented in the Executive.

On the 5th August, 1884, Mr. (now Sir) James G. Lee Steere was provisionally appointed an unofficial member of the Council, subject to Her Majesty's pleasure, the appointment being subsequently confirmed by a despatch from the Colonial Office dated 9th November, 1884.

The Executive Council, therefore, previous to the adoption of Responsible Government on the 21st October, 1890, was composed of:—

The Governor (President).
The Colonial Secretary.
The Attorney General.
The Colonial Treasurer.
The Surveyor General or Commissioner of Crown Lands.
The Director of Public Works and Commissioner of Railways.
One unofficial member.

Legislative Council.

On December the 29th, in the year 1831, was published an Order of the King in Council, for the establishment of a Legislative Council in Western Australia.

The Legislative Council, as at first constituted, consisted solely of the members of the Executive Council, viz.:—

The Governor, Sir James Stirling.
The Commandant, Captain F. C. Irwin.
The Colonial Secretary, Peter Brown.
The Surveyor General, John Septimus Roe.
The Advocate General, George Fletcher Moore.

On the 3rd January, 1839, under the authority of a Royal Order in Council, four unofficial nominee members were added to the list, the gentlemen appointed being:—

W. L. Brockman,
George Leake,
Thomas Peel,
William Tanner.

In June, 1847, the Collector of Revenue was added to the *ex officio* members of the Legislative Council.

In 1868, under an Order by the Queen in Council, the Legislative Council was increased to six official, and six semi-elective unofficial members, the latter nominated for appointment by the districts they represented.

By a notice dated the 7th July, 1868, it was notified for general information in the *Government Gazette* that, "By an Order in Council made at the Court at Windsor the 14th May, 1868, Her Most Gracious Majesty the Queen, with the advice of Her Privy Council, did order that *the Orders in Council* respectively bearing

Digitized by Google

date the 20th March, 1857, the 3rd March, 1859, and the 11th October, 1861, under which the late Legislative Council was constituted, should be, and the same are, thereby revoked; and that—

The Governor for the time being of the Colony of Western Australia, or the Officer administering the Government thereof,
The Senior Officer for the time being Commanding Her Majesty's Land Forces in the said Colony,
The Colonial Secretary of the said Colony for the time being,
The Surveyor General of the said Colony for the time being,
The Attorney General of the said Colony for the time being, and
The Treasurer and Collector of Internal Revenue of the said Colony for the time being; and
John Wall Hardey,
Julian George Charles Carr,
Walter Bateman,
James George Lee Steere,
William Locke Brockman, and
Samuel Pole Phillips, Esquires,

should be, and the same are, thereby constituted a Legislative Council within the said Colony, with the Powers and subject to the conditions and restrictions therein contained; and that the appointment of the above Non-Official Members of such Council should be for a period not exceeding three years. The above appointments to take effect from the date of this notice."

In August, 1870, the nominee Legislative Council was dissolved by the issue of writs under 33 Vict., No. 13, for the election of a Legislative Council, to consist of twelve elected and six nominated members, the latter to consist of three official nominee and three unofficial nominee members; the Council to be presided over by a Speaker. The elections took place in the month of October, and resulted in the Council eventually consisting of the following members:

Official Nominees

Colonial Secretary	Fred. P. Barlee.
Attorney General	R. J. Walcott.
Surveyor General	M. Fraser.

Unofficial Nominees—

S. P. Phillips.
M. Brown.
W. E. Marmion.

Elected Members—

Perth	J. G. C. Carr (Chairman of Committees).
"	Luke S. Leake (Speaker).
Fremantle	E. Newman.
"	W. D. Moore.
Geraldton	Major Logue.
York	J. H. Monger.
Toodyay	Jas. Drummond.
Swan	Thos. C. Gull.
Greenough	George Shenton.
Wellington	Jas. G. Lee Steere.
Vasse . .	J. G. Bussell.
Albany . .	John McKail.

Digitized by Google

In 1874, under 37 Vict., No. 22, the number of members was raised to twenty-one, seven of whom, or one-third of the whole, were to be nominated. The two districts added were the "Murray and Williams" and the "Northern District."

In August, 1876, Mr. Luke Samuel Leake, the Speaker of the Legislative Council, was created a Knight Bachelor.

In 1882, under the 46 Victoria, No. 24, the number of Councillors was further raised to twenty-four, eight of whom were to be nominated. The new district was called the "Gascoyne District," and consisted of the Southern portion of the "Northern District."

And finally, in 1886, an Act (50 Vict., No. 10) was passed, increasing the number of members to twenty-six, nine to be nominated, the Northern portion of the Northern District being taken to form the new "Kimberley District."

The last Council under the old form of Government, which expired on the 21st October, 1890, on the proclamation of the new Constitution, was composed as follows:—

OFFICIAL NOMINEES—

Sir Malcolm Fraser, K.C.M.G.	Colonial Secretary.
C. N. Warton	Attorney General.
J. A. Wright	Director of Works, Engineer-in-Chief, and Commissioner of Railways.
John Forrest, C.M.G.... ...	Surveyor General and Commissioner of Crown Lands.

UNOFFICIAL NOMINEES—

Sir James G. Lee Steere, Kt. (Speaker).
Sir Thomas Cockburn-Campbell, Bart. (Chairman of Committees).
G. Randell.
D. K. Congdon.
J. Morrison.

ELECTED MEMBERS—

L. V. DeHamel	Albany.
W. E. Marmion	Fremantle.
W. S. Pearse...	"
R. F. Sholl	Gascoyne.
McK. Grant	Geraldton.
W. T. Loton	Greenough.
A. Forrest	Kimberley.
W. Paterson	Murray and Williams.
A. R. Richardson	North District.
S. Burt, Q.C....	"
E. Scott	Perth.
E. Keane	"
C. H. Rason	Swan.
G. Shenton	Toodyay.
S. H. Parker...	Vasse.
H. W. Venn	Wellington.
C. Harper	York.

The Legislative Council then consisted of a single Legislative Chamber, and was composed of Twenty-six members, presided over by a Speaker, of whom four were official members, five were nominees of the Crown, and 17 were elected by the different constituencies. The *qualification of* elected members was the possea-

Digitized by Google

sion of £1,000 freehold property. The qualification of an elector was £50 freehold or £10 household, or the lease of Crown lands to the same amount of annual rental.

The elected members were elected for five years, the electoral lists being made up on or before the 10th of April in each year, and all voting was by ballot.

4.—PRESENT CONSTITUTION.

By an almost unanimous vote of the Legislature in July, 1887, a resolution was agreed to affirming the principle of self-Government, and the Governor was requested to take the necessary steps to carry out the wishes of the Legislature. In December, 1888, the Legislative Council was dissolved, and a general election took place in January, 1889, in order that the constituencies might have an opportunity of expressing their views upon the question of the new Constitution. When the Council re-assembled, the Resolution in favour of Responsible Government for the Colony was again carried, this time without a single dissentient voice. The Legislative Council met in April, 1889, and a Constitution Bill, drafted by the Government, was at once brought forward, after amendment passed, and forwarded to the Secretary of State for the Colonies, the Governor (Sir Frederick Napier Broome), Mr. S. H. Parker, and Sir Thomas Cockburn-Campbell being appointed by the Legislature to proceed to England to act as delegates on behalf of the Colony when it came before the Imperial Parliament. Much difficulty was experienced in carrying the measure through its various stages, strong opposition having arisen at home to the granting of Western Australia's demands. This was chiefly, if not entirely, due to a misunderstanding of questions relating to the control of the Crown lands. The latter, it was held, by a not inconsiderable and decidedly demonstrative party in England, were the "heritage of the British people," and should be available and retained for settlement by the surplus population of the mother country. To hand over a million, or even half a million, square miles of country, favoured with a temperate clime, to the 45,000 persons thinly scattered over it, was regarded as a piece of folly verging on political crime. The Bill was, however, referred to a select committee—of which Baron de Worms was Chairman—for the taking of evidence; and so impressed were the members of this body—after hearing what the representatives of the Colony had to communicate to them—with the advantages likely to

result from giving West Australians a free hand in the management of their great national estate, and so convinced were they of the errors underlying the popular opposition to the measure, that they returned it to the House shorn of nearly all the clauses to which the Colony had previously objected, recommending that full and complete control of the Crown lands should be vested in the local Parliament which it was proposed to establish. Thus, by the exertions of the colonial delegates, aided by the influence of Sir William Robinson, who had in the meanwhile succeeded Sir Frederick Broome as Governor of the Colony, and, opportunely, happened to be in England, combined with the intelligence and liberal-mindedness of a majority of the members of the select committee, was Western Australia "one and undivided" obtained for West Australians. Mention should also here be made of the assistance rendered by the Agents-General for the other Australasian Colonies, at a time when, owing to delays due to the Imperial Cabinet, the Bill appeared to be in jeopardy. In a body the Agents-General waited upon the leader of the Government in the House of Commons, and made representations of a character which swept away final obstacles.

The Bill, enabling Her Majesty *to grant a Constitution to Western Australia*, passed its third reading in the Imperial House of Commons in July, and, meeting with no opposition in the Lords, received the Royal assent on the 15th August, 1890.

The present Constitution of Western Australia, as provided by "The Constitution Act of 1889" (52 Victoria, No. 23), "The Constitution Act Amendment Act, 1893" (57 Victoria, No. 14), "The Constitution Act Amendment Act, 1896" (60 Victoria, No. 18), and "The Constitution Acts Amendment Act, 1899" (63 Victoria, No. 19), differs but little from those of the other Australasian States.

The Executive power is vested in the Governor, who is appointed by the Crown, and who acts under the advice of a Cabinet.

Executive Council.

The Executive Council, which was first appointed on the 29th December, 1890, consisted of :—

The Governor (President).
The Colonial Treasurer (Premier).
The Colonial Secretary.
The Attorney General.
The Commissioner of Crown Lands.
The Director of Public Works and Commissioner of Railways.

At the end of 1894, on the resignation of Mr. S. H. Parker, then Colonial Secretary, the Cabinet was reorganised as follows :—

The Governor (President).
The Colonial Treasurer and Colonial Secretary (Premier).
The Minister of Mines.
The Director of Public Works and Commissioner of Railways.
The Commissioner of Crown Lands.
The Minister of Education.
The Attorney General.

Digitized by Google

On the 28th April, 1898, the Executive Council was again reorganised, and as then constituted consisted of :—

The Governor (President).
The Colonial Treasurer (Premier).
The Commissioner of Railways.
The Commissioner of Crown Lands.
The Minister of Mines.
The Attorney General.
The Colonial Secretary.

On Mr. Piesse's resignation of the portfolio of Commissioner of Railways on 23rd August, 1900, the Executive Council was again reorganised, and consisted of the following :—

The Governor (President).
The Colonial Treasurer (Premier).
The Commissioner of Crown Lands.
The Minister of Mines.
The Attorney General.
The Colonial Secretary.
The Commissioner of Railways.

No further change took place until 15th February, 1901, when Sir John Forrest resigned the Premiership, handing over the offices held by him to the Hon. George Throssell. The Council then consisted of :—

The Governor (President).
The Colonial Treasurer (Premier .
The Minister of Mines.
The Colonial Secretary.
The Attorney General.
The Commissioner of Railways.
The Minister for Lands.

On 20th March, 1901, Mr. Pennefather resigned the Attorney Generalship, and was succeeded by Mr. Sayer on 25th March, 1901. The order was then :—

The Governor (President).
The Colonial Treasurer (Premier).
The Minister of Mines.
The Colonial Secretary.
The Commissioner of Railways.
The Minister for Lands.
The Attorney General.

Mr. Throssell tendered the resignation of himself and colleagues on 27th May, 1901, on which date Mr. Leake formed a Ministry, the Executive Council consisting of the following :—

The Governor (President).
The Attorney General (Premier).
The Colonial Treasurer.
The Minister for Works.
The Minister for Lands.
The Commissioner of Railways.
The Minister for Mines.

Dr. Jameson, M.L.C., and Mr. W. H. James, M.L.A., were appointed members of the Council without portfolios.

Digitized by Google

The Leake Government went out of office on 21st November, 1901, giving place to the Morgans' Ministry. The order of precedence in the Executive Council then was:—

The Governor (President).
The Colonial Treasurer (Premier).
The Attorney General.
The Commissioner of Railways.
The Minister for Works.
The Minister for Lands.
The Colonial Secretary.

Mr. Morgans resigned the Premiership on 23rd December, 1901, when Mr. Leake formed his second Ministry. The Executive Council was then constituted as follows:—

The Governor (President).
The Attorney General (Premier).
The Commissioner of Railways.
The Colonial Treasurer and Colonial Secretary.
The Minister for Mines.
The Minister for Lands.
The Minister for Works.

Mr. J. J. Holmes, M.L.A., and the Hon. E. M. Clarke, M.L.C., were appointed members without portfolio.*

Sir William C. F. Robinson was succeeded as Governor on the 5th October, 1895, by Sir Gerard Smith, K.C.M.G. The new Governor arrived in the Colony in December of that year, and took over the Government from Sir Alexander Campbell Onslow, who had acted as Administrator during the Governor's absence. In March, 1900, Sir Gerard Smith left Western Australia on leave of absence, and Sir Alexander Onslow once more resumed duty as Administrator till March, 1901, when he also left on leave of absence, and was succeeded by His Honour the Acting Chief Justice Mr. E. A. Stone as Administrator. The Honourable Sir Arthur Lawley, K.C.M.G., arrived in Perth on 1st May, 1901, and was sworn in as Governor on that date.†

The first Ministry under the new Constitution assumed office on the 29th December, 1890. At the time of its formation it consisted of:—

John Forrest, C.M.G., Colonial Treasurer.
George Shenton, Colonial Secretary.
Septimus Burt, Q.C., Attorney General.
William Edward Marmion, Commissioner of Crown Lands.
Harry Whittall Venn, Commissioner of Railways and Director of Public Works.

---

* Upon the death of the Hon. George Leake, K.C., on the 24th June, 1902, the Leake Ministry resigned, and on the 1st July Mr. Walter Hartwell James, K.C., M.L.A., formed a new Ministry. The present Executive Council consists of:—

The Governor (President).
The Attorney General (Premier).
The Colonial Secretary and Minister for Education.
The Minister for Mines.
The Minister for Lands
The Minister for Works and Railways.
The Colonial Treasurer.

The Hon. Matthew Lewis Moss, M.L.C., is a member as Minister without portfolio.

† Sir Arthur Lawley, being appointed Lieutenant Governor of the Transvaal, left on the 14th August, 1902, and His Honour the Chief Justice, now Sir Edward A. Stone, Kt., is Administrator at the present time.

Digitized by Google

Sir George Shenton, who in the meantime had been Knighted, accepted the appointment of President of the Legislative Assembly, and was succeeded as Colonial Secretary, on the 11th October, 1892, by Mr. Stephen Henry Parker, Q.C. On the 4th December, 1894, Mr. Parker and Mr. Marmion resigned. Mr. Marmion was succeeded by Mr. Alexander Robert Richardson, whilst under a re-arrangement of the Cabinet, Mr. Edward Horne Wittenoom was appointed Minister of Mines and Education on the 19th December, the Premier, Sir John Forrest, undertaking the combined duties of Colonial Secretary and Treasurer. On the 10th March, 1896, Mr. Venn was succeeded by Mr. Frederick Henry Piesse. In March, 1897, Mr. Richardson was succeeded by Mr. George Throssell. In May Mr. Henry Bruce Lefroy was appointed Minister of Education. On the 27th October Mr. S. Burt resigned, and was succeeded by Mr. Richard William Pennefather.

On the appointment of the Hon. E. H. Wittenoom as Agent General for the Colony, he resigned his position as Minister of Mines, and the Cabinet of Western Australia was, on the 28th April, 1898, once more reconstructed as follows:—

Premier and Colonial Treasurer, The Right Hon. Sir John Forrest, P.C., K.C.M.G., M.L.A.
Commissioner of Railways, The Hon. Frederick Henry Piesse, M.L.A.
Commissioner of Crown Lands, The Hon. George Throssell, M.L.A.
Minister of Mines, The Hon. Henry Bruce Lefroy, M.L.A.
Attorney General, The Hon. Richard William Pennefather, M.L.A.
Colonial Secretary, The Hon. George Randell, M.L.C.

Mr. Piesse resigned as Commissioner of Railways on 23rd August, 1900, and was succeeded by Mr. B. C. Wood.

On Sir John Forrest's resignation, on the 15th February, 1901, Mr. Throssell became Premier and Colonial Treasurer, the personnel of the Cabinet being:—

Premier and Colonial Treasurer, The Hon. George Throssell, M.L.A.
Minister of Mines, The Hon. Henry Bruce Lefroy, M.L.A.
Colonial Secretary, The Hon. George Randell, M.L.C.
Attorney General, The Hon. Richard William Pennefather, K.C., M.L.A.
Commissioner of Railways, The Hon. Barrington Clarke Wood, M.L.A.
Minister for Lands, The Hon. Charles John Moran, M.L.A.

On his temporary elevation to the Judicial Bench on 25th March, 1901, Mr. Pennefather resigned the Attorney Generalship, and Mr. W. F. Sayer was appointed to the position.

Mr. Throssell's Cabinet resigned on 27th May, 1901, and was succeeded on that date by the Leake Ministry, which consisted of:—

Premier and Attorney General, The Hon. George Leake, K.C., M.L.A.
Colonial Treasurer and Colonial Secretary, The Hon. Frederick Illingworth, M.L.A.
Minister for Works, The Hon. Walter Kingsmill, M.L.A.
Minister for Lands, The Hon. Charles Sommers, M.L.C.
Commissioner of Railways, The Hon. Joseph John Holmes, M.L.A.
Minister for Mines, The Hon. Henry Gregory, M.L.A.

Digitized by Google

The Honourable Adam Jameson, M.D., M.L.C., and Mr. Walter Hartwell James, M.L.A., were appointed Ministers without portfolio on 28th June, 1901.

Owing to an adverse vote being carried against his Government in the Legislative Assembly, Mr. Leake resigned on 21st November, 1901. Mr. Piesse was then called upon to form a Ministry, but was unsuccessful, the task eventually being allotted to Mr. A. E. Morgans, who succeeded in forming a Cabinet, consisting of the following:—

Premier and Colonial Treasurer, The Hon. Albert Edward Morgans, M.L.A.
Attorney General, The Hon. Frederick William Moorhead, K.C., M.L.A.
Commissioner of Railways, The Hon. Frank Wilson, M.L.A.
Minister for Works, The Hon. Timothy Francis Quinlan, M.L.A.
Minister for Lands, The Hon. John Leighton Nanson, M.L.A.
Colonial Secretary, The Hon. Matthew Lewis Moss, M.L.C.

At the elections consequent upon their appointment to "offices of profit under the Crown," two of Mr. Morgan's colleagues, viz., Messrs. Moss and Wilson, were rejected by their constituents. This brought about another change of Government, as on 23rd December, 1901, Mr. Morgans tendered his resignation and that of his colleagues. Mr. Leake was then again sent for, and formed his second Ministry, which consisted of the following:—

Premier and Attorney General, The Hon. George Leake, K.C., M.L.A.
Commissioner of Railways, The Hon. Walter Kingsmill, M.L.A.
Colonial Treasurer and Colonial Secretary, The Hon. Frederick Illingworth, M.L.A.
Minister for Mines, The Hon. Henry Gregory, M.L.A.
Minister for Lands, The Hon. Adam Jameson, M.L.C.
Minister for Works, The Hon. Cornthwaite Hector Rason, M.L.A.

Mr. Joseph John Holmes, M.L.A., and the Hon. Ephraim Mayo Clarke, M.L.C., were appointed members of the Ministry without portfolio. *

---

* *See* note * on page 381. The present Ministry consists of the following:—

Premier and Attorney General, The Hon. Walter Hartwell James, K.C., M.L.A.
Departments—Crown Law; Administration of Justice, including Supreme Court, Official Receiver in Bankruptcy's office, Curator of Intestate Estates office, Sheriff's office, and Stipendiary Magistracy; Audit office; Friendly Societies' office; Land Titles and Deeds office; and Patents, Designs, and Trade Marks office.

Colonial Secretary and Minister for Education, The Hon. Walter Kingsmill, M.L.A.
Departments—Colonial Secretary's office, including Aborigines, Charities, Electoral, Fisheries, Gaols, Government Gardens, Medical, Observatory, Photo-Lithographic, Police, Printing, Public Health, Registry and Statistics; and Education.

Minister for Mines, The Hon. Henry Gregory, M.L.A.
Departments—Mines, Geological Survey, and Steam Boilers Act.

Minister for Lands, The Hon. Adam Jameson, M.L.C.
Departments—Lands and Surveys, including Woods and Forests; and Agriculture, including Agricultural Bank, Stock, and Rabbits.

Minister for Works and Railways, The Hon. Cornthwaite Hector Rason, M.L.A.
Departments—Public Works, Public Buildings, and Railways and Tramways.

Colonial Treasurer, The Hon. James Gardiner, M.L.A.
Departments—Treasury, including Explosives and Analytical, Government Stores, Harbour and Light, London Agency, and Post Office Savings Bank.

Minister without portfolio, The Hon. Matthew Lewis Moss, M.L.C.

Digitized by Google

LEGISLATIVE.

The Legislative authority is vested in a Parliament composed of two Houses—the Legislative Council and the Legislative Assembly.

Legislative Council.

After the establishment of Responsible Government the Legislative Council was, in the first instance, nominated by the Governor; but it was provided that so soon as the population of the Colony reached 60,000, it should be elective. On the 18th July, 1893, it was proclaimed that this limit of population was reached, and Parliament soon afterwards passed an Act (57 Vict., No. 14) amending the Constitution.

The first Legislative Council under Responsible Government was composed as follows:—

Amherst, Hon. J. G. H.
Brockman, E. R.
Burges, T.
Bush, R. E.
Cockburn-Campbell, Sir T. Bart. (President).
Grant, M.
Hackett, J. W.
Hamersley, E.
Hardey, R. W.
Leake, G. W.
Monger, J. H.
Moore, W. D.
Morrison, J.
Shenton, G. (Colonial Secretary).
Wright, J. A.

By "The Constitution Acts Amendment Act, 1896," the Colony was divided into eight electoral provinces. "The Constitution Acts Amendment Act, 1899," divided the Colony into the following ten provinces, each returning three members to the Legislative Council.

Central.—Comprising Cue, Geraldton, Greenough, Irwin, Mount Magnet, Murchison, and North Murchison electoral districts.

East.—Comprising Beverley, Moore, Northam, Swan, Toodyay, and York electoral districts.

Metropolitan.—Comprising Perth, East Perth, North Perth, and West Perth electoral districts.

Metropolitan-Suburban.—Comprising Claremont, Guildford, South Perth, and Subiaco electoral districts.

North.—Comprising Gascoyne, East Kimberley, West Kimberley, Pilbara, and Roebourne electoral districts.

North-East.—Comprising Boulder, Hannans, Kalgoorlie, Kanowna, Mount Margaret, and Menzies electoral districts.

South.—Comprising Mount Burges, Coolgardie, Dundas, and Yilgarn electoral districts.

South-East.—Comprising Albany, Plantagenet, and Williams electoral districts.

South-West.—Comprising Bunbury, Murray, Nelson, South-West Mining, Sussex, and Wellington electoral districts.

West.—Comprising Cockburn Sound, Fremantle, East Fremantle, North Fremantle, and South Fremantle electoral districts.

Digitized by Google

Tenure of Seat (six years).—At the expiration of two years from the date of election, and every two years thereafter, the senior member for the time being for each province retires. Seniority is determined (1) by date of election; (2) if two or more members are elected on the same day, then the senior is the one who polled the least number of votes; (3) if the election be uncontested, or in case of an equality of votes, then the seniority is determined by the alphabetical precedence of surnames and, if necessary, Christian names.

Qualifications of Members.—Being (1) a man of 30 years of age and free from legal incapacity; (2) a resident in the State for at least two years; (3) a natural-born subject of His Majesty, or naturalised for five years and resident in the State during that period.

Disqualification as a Member.—If he (1) be a member of the Legislative Assembly; (2) be a Judge of the Supreme Court; (3) be the Sheriff of Western Australia; (4) be a clergyman or minister of religion; (5) be an undischarged bankrupt or debtor against whose estate there is a subsisting receiving order in bankruptcy; (6) has been in any part of His Majesty's dominions attainted or convicted of treason or felony; (7) be directly or indirectly interested in a Government contract or agreement; (8) shall hold any office of profit or emolument under the Crown other than that of an officer of His Majesty's sea or land forces on full, half, or retired pay, except as one of the six Responsible Ministers, or as President of the Council.

Qualification of Electors. — "The Constitution Act Amendment Act, 1899," has extended the right to vote equally to both sexes. Every person seeking to be registered as an elector must (1) be at least 21 years of age, and not subject to any legal incapacity; (2) be a natural-born or naturalised subject of His Majesty, resident in the State for six months; (3) either: (*a*) possess within the electoral province for which he seeks to be registered, a freehold estate of the clear value of £100; or: (*b*) be a householder within the province, the dwelling-house being of the clear annual value of £25; or: (*c*) be a holder of a leasehold of the clear annual value of £25; or: (*d*) be a holder of a lease or license from the Crown at an annual rental of at least £10; or: (*e*) have his or her name on the Electoral List of a Municipality or Roads Board in respect of property in the province of the annual ratable value of £25. When registered for six months he or she shall be entitled to vote for each of any number of candidates not exceeding the number of members to be elected for the province.

Disqualification of Electors.—Foreigners or persons who are not naturalised subjects of His Majesty, or have not been naturalised for at least 12 months before making the claim, or any person who has been attainted or convicted of treason, felony, or any infamous offence *in any part of* His Majesty's dominions,

Digitized by Google

unless he or she shall have served his or her sentence for the same, or have received a free or conditional pardon. No aboriginal native of Australia, Asia, or Africa, or person of the half-blood, except in respect of a freehold qualification, can be registered. No elector can be registered more than once for a province.

The following is a list of members composing the Legislative Council at the first session of the fourth Parliament, in December, 1901:—

	Member.	Date of Election.	Province.	No. of Electors on Roll, April, 1900.	No. of Electors on Roll, December, 1901.
1	Bellingham, The Honourable George ...	5th Sept., 1900	South... ...	...	824
2	Briggs, The Honourable Henry	29th April, 1898	West	2440	4191
3	Brimage, The Honourable Thomas Frederick Outridge	5th Sept., 1900	South		
4	Brookman, The Honourable William Gordon	29th Aug., 1900	M't'p'n-Sub'n	...	3147
5	Burges, The Honourable Richard Goldsmith	29th April, 1898	East	1645	2013
6	Clarke, The Honourable Ephraim Mayo ...	August, 1901	South-West...	725	1310
7	Connolly, The Honourable James Daniel ..	June, 1901 ...	North-East ...	1962	3123
8	Crowder, The Honourable Frederick Thomas	Nov., 1901 ...	East		
9	Dempster, The Honourable Charles Edward	14th May, 1900	East		
10	Drew, The Honourable John Michael ...	Do.	Central ...	773	1246
11	Glowrey, The Honourable John Thomas ...	5th Sept., 1900	South		
12	Hackett, The Honourable John Winthrop...	3rd May, 1900	South-West		
13	Haynes, The Honourable Richard Septimus	27th July, 1896	Central		
14	Haynes, The Honourable Samuel Johnson...	29th April, 1898	South-East ...	883	1183
15	Jameson, The Honourable Adam	29th Aug., 1900	M't'p'n-Sub'n		
16	Jenkins, The Honourable Arthur George ...	13th May, 1898	North-East		
17	Kidson, The Honourable Alfred Bowman ...	16th July, 1896	West		
18	Laurie, The Honourable Robert	Dec., 1901 ...	West		
19	Maley, The Honourable Wesley ...	14th May, 1900	South-East		
20	McKay, The Honourable Donald McDonald	27th July, 1896	North ...	156	289
21	McLarty, The Honourable Edward	29th April, 1898	South-West		
22	O'Brien, The Honourable Bartholomew Cornelius	Dec., 1900 ...	Central		
23	Piesse, The Honourable Charles Austin ...	16th July, 1896	South-East		
24	Randall, The Honourable George	29th April, 1898	Metropolitan	3467	6382
25	Richardson, The Honourable John Elliott...	21st April, 1898	North		
26	Saunders, The Honourable Henry John ...	16th July, 1896	Metropolitan		
27	Shenton, The Honourable Sir George, Kt. (President)	14th May, 1900	Metropolitan		
28	Sommers, The Honourable Charles	Do. ...	North-East		
29	Speed, The Honourable James Montgomery	29th Aug., 1900	M't'p'n-Sub'n		
30	Stone, The Honourable Frank Mends ...	3rd May, 1900	North		
	Total number of electors on roll ...	...	...	11951	23608

By the "Payment of Members Act, 1900," it was enacted that members of the Legislative Council should be entitled to receive payment at the rate of two hundred pounds per annum; but if in receipt of any official salary or annual sum out of the Consolidated Revenue, no member is entitled to such payment, except in so far as it may exceed the amount of such official salary or annual sum.

Digitized by Google

Legislative Assembly.

The first Legislative Assembly under Responsible Government was composed as follows:—

Baker, W. L., East Kimberley
Burt, S., Q C., Ashburton, Attorney General
Canning, M. F. A., East Perth
Clarkson, B. D., Toodyay
Cookworthy, J., Sussex
Darlôt, E. F., Murchison
DeHamel, L., Albany
Forrest, J., C.M.G., Bunbury, Premier and Treasurer
Forrest, A., West Kimberley
Harper, C., Beverley
Hassell, A. Y., Plantagenet
Keane, E., Geraldton
Leake, G., Roebourne
Loton, W. T., Swan
Marmion, W. E., Fremantle, Commissioner of Crown Lands
Parker, S. H., Q.C., York
Paterson, W., Murray
Pearse, W. S., North Fremantle
Phillips, S. J., Irwin
Piesse, F. H., Williams
Quinlan, T. F., West Perth
Randell, G., Moore, Chairman of Committees
Richardson, A. R., DeGrey
Scott, E., Perth
Sholl, R. F., Gascoyne
Steere, Sir J. G. Lee, Kt., Nelson, Speaker
Symon, D., South Fremantle
Throssell, G., Northam
Traylen, W., Greenough
Venn, H. W., Wellington.

"The Constitution Acts Amendment Act, 1896," divided the Colony into forty-four electorates. By "The Constitution Acts Amendment Act, 1899," Western Australia was divided into the following fifty electorates for the Legislative Assembly, each represented by one member:—

LIST OF ELECTORATES.

Albany
Beverley
Boulder
Bunbury
Claremont
Cockburn Sound
Coolgardie
Cue
Dundas
Fremantle
Fremantle, East
Fremantle, North
Fremantle, South
Gascoyne
Geraldton
Greenough
Guildford
Hannans
Irwin
Kalgoorlie
Kanowna
Kimberley, East
Kimberley, West
Menzies
Moore
Mt. Burgess
Mt. Magnet
Mt. Margaret
Murchison
Murchison, North
Murray
Nelson
Northam
Perth
Perth, East
Perth, North
Perth, South
Perth, West
Pilbara
Plantagenet
Roebourne
South-West Mining
Subiaco
Sussex
Swan
Toodyay
Wellington
Williams
Yilgarn
York

The members of the Legislative Assembly are elected for a period of three years.

Digitized by Google

QUALIFICATIONS OF A MEMBER.—Any man who has resided in the State for twelve months, if he be twenty-one years of age and not subject to any legal incapacity, and is a natural born subject of the King, or, if not a natural born subject of the King, shall have been naturalised for five years and shall have resided in the State for two years.

DISQUALIFICATIONS OF A MEMBER.—If he (1) be a member of the Legislative Council; (2) be a Judge of the Supreme Court; (3) be Sheriff of Western Australia; (4) be a clergyman or minister of religion; (5) be an undischarged bankrupt, or debtor against whose estate there is a subsisting receiving order in bankruptcy; (6) has been in any part of His Majesty's dominions attainted or convicted of treason or felony; (7) be directly or indirectly concerned in any contracts for the public service; (8) shall hold any office or place of profit or emolument under the Crown other than that of an officer of His Majesty's sea or land forces on full, half, or retired pay, except as one of the six Responsible Ministers, or as Speaker or Chairman of the Legislative Assembly.

QUALIFICATIONS OF ELECTORS.—Every person seeking to be registered as an elector must be of the age of twenty-one years, a natural born or naturalised subject of His Majesty, not subject to any legal incapacity, must have resided in the State for at least six months, and must be (1) a resident in the district at the time of making his or her claim; or (2) have a freehold estate in the district of the clear value of £50; or (3) be a householder, the house or premises being of the clear annual value of £10; or (4) be the holder of a leasehold of the clear annual value of £10; or (5) be the holder of a lease or license of Crown Lands, at an annual rental of £5; or (6) have his or her name on the Electoral List of a Municipality or Roads Board in respect of property within the district. When registered for six months he or she shall be entitled to vote for a member for the district.

DISQUALIFICATIONS OF ELECTORS.—Foreigners and persons who are not naturalised subjects of His Majesty, or have not been naturalised for at least six months before making the claim, or any person who has been attainted or convicted of treason, felony, or any infamous offence in any part of His Majesty's dominions, unless he or she shall have served his or her sentence for the same, or have received a free or conditional pardon. No aboriginal native of Australia, Asia, or Africa, or persons of the half-blood, except in respect of a freehold qualification, can be registered. No elector can be registered more than once for a district.

The Electoral Rolls are revised during May in each year.

Under the Constitution Acts Amendment Act £6,200 is secured for the payment of the six Ministerial salaries.

Digitized by Google

The following Return for the year 1901 gives the names of the members for the several electorates, with the date of election, number of electors on the roll, and number of electors who voted :—

—	Member.	When elected.	District.	No. of Electors on Roll at time of last Election.	No. who voted. *	No. of Electors on Roll Dec. 31, 1901.
1	Butcher, William James, Esq. ...	April, 1901	Gascoyne	403	191	442
2	Connor, Francis, Esq.	April, 1901	East Kimberley ...	108	66	171
3	Daglish, Henry, Esq.	April, 1901	Subiaco	3030	1713	3253
4	Diamond, Arthur James, Esq. ...	April, 1901	South Fremantle	3310	1352	3254
5	Doherty, Denis Joseph, Esq. ...	April, 1901	North Fremantle	2007	1120	1784
6	Ewing, John, Esq.	April, 1901	S.W. Mining District	1230	746	1724
7	Forrest, Alexander, Esq. *a*	April, 1901	West Kimberley ...	251	135	281
8	Gardiner, James, Esq.	April, 1901	Albany	1667	859	1675
9	George, William James, Esq. ...	April, 1901	Murray	1644	805	2035
10	Gordon, William Beattie, Esq. ...	April, 1901	South Perth ...	2197	932	2823
11	Gregory, The Hon. Henry	April, 1901	Menzies	2420	...	2030
12	Harper, Charles, Esq.	April, 1991	Beverley	505	291	641
13	Hassell, Albert Young, Esq.	April, 1901	Plantagenet ...	1329	650	1236
14	Hastie, Robert, Esq.	April, 1901	Kanowna	5805	1615	4146
15	Hayward, Thomas, Esq.	April, 1901	Bunbury	1443	916	1550
16	Hicks, John Sydney, Esq.	April, 1901	Roebourne	299	...	262
17	Higham, John Joseph, Esq.	April, 1901	Fremantle	1341	303	994
18	Holmes, The Hon. Joseph John ...	April, 1901	East Fremantle ...	3020	1458	2930
19	Hopkins, John Marquis, Esq. ...	April, 1901	Boulder	2020	1129	2445
20	Hutchinson, Robert David, Esq. ...	April, 1901	Geraldton	1041	...	918
21	Illingworth, The Hon. Frederick	April, 1901	Cue	1679	729	958
22	Jacoby, Mathieson Harry, Esq. ...	April, 1901	Swan	1272	572	1222
23	James, Walter Hartwell, Esq. ...	April, 1901	East Perth ...	2495	988	2092
24	Johnson, William Dartnell, Esq. ...	April, 1901	Kalgoorlie ...	4126	2068	3904
25	Kingsmill, The Hon. Walter ...	April, 1901	Pilbara	431	...	530
26	Leake, The Hon. George, K.C. ...	April, 1901	West Perth ...	3707	1736	3258
27	Monger, Frederick Charles, Esq. ...	April, 1901	York	1016	...	1064
28	Moorhead, Frederick William, Esq. *b*	April, 1901	North Murchison	787	308	751
29	Morgans, Alfred Edward, Esq. ...	April, 1901	Coolgardie	3732	1610	3383
30	McDonald, Francis, Esq.	April, 1901	Cockburn Sound ...	1359	669	1684
31	Nanson, John Leighton, Esq. ...	April, 1901	Murchison	455	311	481
32	Oats, William, Esq.	April, 1901	Yilgarn	989	471	888
33	O'Connor, Michael, Esq.	April, 1901	Moore	665	428	739
34	Phillips, Samuel James, Esq. ...	April, 1901	Irwin	233	...	268
35	Piesse, The Hon. Frederick Henry ...	April, 1901	Williams	1108	...	1097
36	Quinlan, Timothy Francis, Esq. ...	April, 1901	Toodyay	717	545	762
37	Rason, Cornthwaite Hector, Esq. ...	April, 1901	Guildford	1412	814	1617
38	Reid, Fergie, Esq.	April, 1901	Mount Burges ...	2572	863	2834
39	Reside, John, Esq.	April, 1901	Hannans	7024	2844	6679
40	Sayer, William Frederic, Esq. ...	April, 1901	Claremont	2755	1456	2749
41	Smith, Henry Teesdale, Esq. ...	April, 1901	Wellington ...	1113	631	1515
42	Speight, Richard, Esq. *c*	April, 1901	North Perth ...	4809	1799	4556
43	Steere, The Hon. Sir James George Lee, K.C.M.G.	April, 1901	Nelson	410	...	553
44	Stone, Patrick, Esq.	April, 1901	Greenough ...	482	324	548
45	Taylor, George, Esq.	April, 1901	Mount Margaret ...	2723	1494	3100
46	Thomas, Albert Ernest, Esq. ...	April, 1901	Dundas	1566	860	1302
47	Throssell, George, Esq.	April, 1901	Northam	1822	...	2042
48	Wallace, Frank, Esq.	April, 1901	Mount Magnet ...	1339	646	1210
49	Wilson, Frank, Esq. *d*	April, 1901	Perth	2748	1066	2256
50	Yelverton, Henry John, Esq. ...	April, 1901	Sussex	906	574	807
	Total number of electors on the roll	...	...	91522	...	89442
	Number of electors in the 41 contested electorates	...	...	82742	38087	

a Deceased. Succeeded by Sydney Capel Pigott, Esq., August, 1901. *b* Succeeded by John Barkell Holman, December, 1901. *c* Deceased. Succeeded by George Frederick McWilliams, Esq., October, 1901. *d* Succeeded by William Morton Purkiss, Esq., December, 1901. * Where no number is given, the member was returned unopposed.

Digitized by Google

Under the provisions of "The Constitution Acts Amendment Act, 1899," the number of electors on the roll rose from 46,554 in April, 1900, to 91,522 in April, 1901. Of the latter, 16,648 were female electors. In the 41 contested electorates, out of 67,967 male electors only 29,832 recorded their votes, or 43·89 per cent.; whilst out of 14,775 female electors, 8,255 voted, or 55·87 per cent. The percentage of total votes recorded in those electorates to the total number of electors was 46·03, as against 52·68 at the elections in 1897, 61·08 in 1894, and 78·33 in 1890. Allowance must be made, however, for a certain amount of inaccuracy in the electoral lists in April, 1901. This is proved by the fact that in December, 1901, the total number of electors on the rolls had fallen to 89,442, although the population had increased by nearly 10,000.

The members of the Legislative Assembly receive payment at the rate of two hundred pounds per annum; but if in receipt of any official salary or annual sum out of the Consolidated Revenue, no member is entitled to such payment, except in so far as it may exceed the amount of such official salary or annual sum. A free pass is granted to members of both Houses over all Government lines of railway, and by courtesy the same privilege is extended to them over the lines belonging to private companies.

5.—LOCAL GOVERNMENT.

It is only to be expected that at present the system of Local Government is making comparatively slow progress in Western Australia, where a mere handful of people are thinly scattered over so vast an area.

Taking, however, into consideration the benefits accruing from a comprehensive scheme for the decentralisation of power, particularly in a country of very vast dimensions, and judging by the success of similar institutions elsewhere in Australasia, it may reasonably be expected that, as population increases, the people of this State will take full advantage of the various forms of self-government at present provided.

(A.)—MUNICIPALITIES.

Before the now repealed Municipal Institutions Act of 1895 came into operation, various Ordinances and Acts had from time to time been passed and amended, in order to cope with the growing demand for self-governing power, which asserted itself with the increase of population.

The first Act relating to the establishment of Municipalities was assented to on the 2nd of January, 1871, and under its provisions the City of Perth was proclaimed a Municipality, and very

Digitized by Google

shortly afterwards the following centres were brought under its operations, viz.:—Fremantle, Albany, Geraldton, Bunbury, Busselton, Guildford, and York, all of which were gazetted "Municipalities" during the first quarter of 1871. Since then the list has been added to from time to time, until on 31st October, 1900, there were 39 declared Municipalities in existence in Western Australia.

Collie, Paddington, and North Perth were gazetted municipalities during the year 1901, thereby increasing the number to 42 at the end of that year*.

The laws relative to municipalities became consolidated and further amended with the passing of "The Municipal Institutions Act, 1900" (64th Vict., No. 8), under the provisions of which their affairs are now guided and determined.

Municipalities†—Area, Population, Buildings, etc. (1900).

No.	Name of Municipality.	Date when Municipality was first gazetted.	Date on which latest Alteration of Boundaries was gazetted.	Incorporated Area of the Municipality on the 31st October, 1900.‡	Population and Dwellings as per Census on the 31st March, 1901. Population within the Municipal Boundaries. Males.	Females.	Total.	Number of Dwellings within the Municipal Boundaries. Occupied.	Unoccupied	Total.
				Acres.	No.	No.	No.	No.	No.	No.
1	Albany	21-2-71	25-10-88	5375	1782	1812	3594	754	74	828
2	Beverley	31-3-92	...	1280	113	83	196	37	2	39
3	Boulder	6-8-97	6-10-99	398	2724	1877	4601	1332	104	1436
4	Broad Arrow	26-2-97	10-6-98	1375	343	199	542	176	7	183
5	Bulong	13-11-96	25-2-98	117	110	81	191	76	...	76
6	Bunbury	21-2-71	22-10-97	2016	1229	1226	2455	477	57	534
7	Busselton	21-2-71	...	800	217	235	452	85	10	95
8	Carnarvon	4-6-91	...	7250	186	104	290	65	...	65
9	Claremont	17-6-98	13-7-00	1158	1038	976	2014	428	19	447
10	Coolgardie	6-7-94	21-10-98	1715	2403	1846	4249	1143	61	1204
11	Cossack	1-12-87	...	2600	127	39	166	53	10	63
12	Cue	1-6-94	...	160	755	436	1191	340	15	355
13	Day Dawn	8-9-92	21-12-94	109	260	93	353	81	...	81
14	Esperance	27-9-95	11-8-99	1516	174	167	341	78	29	107
15	Fremantle	21-2-71	8-9-92	2755	8366	6342	14708	2704	21	2725
16	Fremantle, East ...	2-4-97	23-6-99	755	1324	1170	2494	548	23	571
17	Fremantle, North ...	13-9-95	...	794	1796	1450	3246	703	13	716
18	Geraldton	21-2-71	...	1920	1287	1171	2458	489	59	548
19	Gingin	23-2-93	...	260	96	61	157	28	7	35
20	Guildford	21-2-71	...	725	718	741	1459	297	5	302
21	Helena Vale	8-11-95	26-2-97	785	911	657	1568	308	2	310
22	Kalgoorlie	15-2-95	9-9-99	1120	4039	2613	6652	1815	136	1951
23	Kanowna	28-2-96	13-1-99	600	629	415	1044	346	22	368
24	Leederville	3-4-96	...	875	1331	1215	2546	611	44	655
25	Leonora	31-8-00	...	606	225	89	314	98	...	98
26	Malcolm	26-10-00	9-11-00	456	146	104	250	87	1	88
27	Menzies	30-8-95	12-2-97	955	1050	437	1487	391	8	399
28	Mount Magnet	1-5-96	18-3-98	1353	241	133	374	97	...	97
29	Mount Morgans ...	12-10-00	...	1112	503	140	643	284	...	284
30	Nannine	24-7-96	...	83	72	21	93	26	6	32
31	Newcastle	2-10-77	...	800	167	172	339	62	6	68
32	Norseman	17-1-96	...	640	155	108	263	70	10	80
33	Northam	4-11-79	27-8-97	1337	1073	945	2018	423	20	443
34	Perth	a 2-1-71	10-8-00	3575	14591	12962	27553	5004	104	5108
35	Roebourne	1-12-87	...	6336	212	100	312	76	11	87
36	Southern Cross ...	16-6-92	...	608	351	213	564	145	5	150
37	Subiaco	26-3-97	...	1444	1514	1490	3004	698	11	709
38	Victoria Park	30-4-97	27-4-00	3944	674	593	1267	285	40	325
39	York	7-3-71	2-8-95	4350	673	689	1362	271	25	296

* Since the end of the year 1901, South Perth and Kookynie have been gazetted municipalities.

† On the 28th of October, 1879, the town of Northampton was declared a Municipality. No advantage, however, having been taken of the Proclamation, the name of the Municipality has been excluded from the present returns. ‡ Supplied by Survey Departm

(a.) Constituted a *Municipality by "The Municipal Institutions Act, 1871"* (34 Vict

Digitized by Google

Constitution of Municipalities.

Under the new Consolidated Act the Governor may from time to time, by proclamation in the *Government Gazette*, declare any town or locality to be a municipality if containing ratable property capable of yielding a sum of at least three hundred pounds, calculated upon a rate of one shilling in the pound on the annual value of such property. The Governor may likewise, by proclamation, define the boundaries of a municipality, divide any municipality into wards, and define their boundaries, unite contiguous municipalities into one, or sever portion of a municipality, either declaring such portion to be a new municipality, or annexing it to some other contiguous municipality or roads board. He may also, under certain circumstances and conditions, determine or alter the number of councillors constituting a council, declare certain municipalities to be "cities," alter the name or declare the population of any municipality, apportion property, rights, and liabilities, and give any directions necessary to do justice as between municipalities and roads boards concerned.

Qualification of Mayor and Councillors.

Every owner or occupier liable to be rated in respect of land of a ratable value of not less than £10 shall be eligible for election as a mayor or councillor for a municipality, but no councillor shall be capable of being elected an auditor in and for the municipality of which he is a councillor.

Disqualifications. — No person shall be qualified to be elected as, or hold office of, mayor, councillor, or auditor, in any municipality, if being a female, or a Minister of religion, or a person attainted of treason, or convicted of felony, or perjury, or any infamous crime, or of unsound mind, or a person who has made a composition with his creditors under any Bankruptcy Act in force at the time being, or a person holding any office or place of profit in the gift or disposal of the council of any municipality, or concerned or participating in any contract or employment with any municipality, or in any works to be done under the authority of any such council. Provided that such disqualification shall not extend to any mayor, councillor, or auditor by reason of his being beneficially interested in any newspaper in which the council inserts advertisements, or by reason of being a proprietor or shareholder, or a shareholder in any duly incorporated company, having at least twenty *bonâ fide* shareholders, during a contract or contracts with any council, or who, in the ordinary course of business, and not pursuant to any written contract, *bonâ fide* sells goods to or does work for such municipality. No person elected to be mayor, councillor, or auditor shall be qualified to act as such until he has first taken the oath or affirmation of allegiance to the Sovereign.

Supervening Disqualification.—Should any mayor or councillor during his term of office be adjudicated a bankrupt, or make any

Digitized by Google

assignment to or composition with his creditors under any Bankruptcy Act in force, or absent himself without leave from the meetings of the council for more than four ordinary meetings, or cease to hold the qualifications above specified, he shall thereby cease to be qualified to continue to hold office.

Penalty for acting whilst disqualified.—Any mayor, councillor, or auditor who acts in such capacity before he has taken the prescribed oath, or continues to act after disqualifications have supervened, is liable to a penalty of Fifty pounds for every such offence.

Qualification of Electors.

Every British subject of the full age of twenty-one years, being resident within the State, and not subject to any legal incapacity, who—

(1.) On the first day of September in any year is seised of, or in occupation of, any ratable land within the limits of any municipality or city; and

(2.) Has, on or before the first day of September, paid all sums due and payable by him in respect of Health Rates, and any rates and assessments ordered to be struck by the council for the current year,

shall be entitled to have his name inserted in the municipal electoral list for such municipality, and the ward electoral list for each ward in which any such land is situated; provided that in no case shall the owner of land and the person in occupation thereof be both separately enrolled or inserted in such list in respect of such land, or any part thereof; and provided also that the person in occupation of any ratable land shall be entitled to be enrolled in respect of such land instead of the owner thereof.

When a corporation or firm is liable to be rated in respect of land in any municipality, such corporation or firm may, by letter, delivered on or before the first day of September in any year to the town clerk, appoint a person to be enrolled in the place of such corporation or firm, and such person shall, for the purposes of this Act, be deemed liable to be rated in respect of land in such municipality of equal ratable value to that for which the corporation or firm is liable to be rated.

Where more persons than one are jointly liable to be rated in respect of land in any municipality, such persons may, by writing under their hands, delivered to the town clerk on or before the first day of September in any year, appoint one of their number to be enrolled in respect of such land, and such person shall, for the purposes of this Act, be deemed liable to be rated in respect of such land.

Elections.

Election of Council and Auditors.—The mayor and auditors shall be elected by the persons whose names are on the Municipal Electoral List in force for the time being within the munici

Digitized by Google

and at any such elections, and also in voting upon the question of any proposed loan, each person shall have a number of votes proportionate to the ratable value of the land of which such person is seised or possessed as owner or occupier, set against his name on the said list, according to the following scale:—

Ratable Value of Land.	Number of Votes.
Twenty-five pounds and under	One
Over twenty-five pounds and not exceeding fifty pounds	Two
Exceeding fifty pounds and not exceeding seventy-five pounds	Three
Exceeding seventy-five pounds	Four

The councillors for each ward shall be elected by the persons whose names are on the Ward Electoral List in force for the time being within such ward; and at any such election each person shall have one or two votes proportionate to the ratable value of the land of which such person is seised or possessed within such ward, as owner or occupier, set against his name on the said ward electoral list according to the following scale:—

Ratable Value of Land.	Number of Votes.
Fifty pounds and under	One
Exceeding fifty pounds	Two

Preparation of Electoral Lists.—On or before the twentieth day of September in each year the town clerk shall make out a list to be called "The Voters' List," of the names of all persons entitled to have their names inserted in the ward electoral list as voters at the election of councillors for such ward; and also of all persons entitled to have their names inserted in the municipal electoral list, as voters at the election of a mayor and auditors, and shall arrange such list according to the alphabetical order of surnames contained therein, and shall state against the name of each person the particulars required by the Act. The said lists shall be signed or initialled by the mayor, and a copy thereof shall be affixed on some building in each ward.

Appeals against Voters Lists as Prepared.—Any person, on or before the thirtieth day of September in any year,—

(*a.*) Whose name has been omitted from such electoral lists, may apply by letter, delivered or sent through the post addressed to the town clerk, to have his name inserted therein, and shall give particulars of his claim;

(*b.*) Whose name has been inserted in such electoral lists as a voter, who is dissatisfied with such lists as not specifying the full ratable value of the land of which he is seised or possessed, may likewise apply to the town clerk to have the amount of such ratable value altered, and shall give particulars of such claim;

Digitized by Google

(*c.*) Whose name appears on such electoral lists, or who claims to have his name inserted in such lists, may object to any other person as not being entitled to have his name retained thereon; or as not being entitled to have the number of votes set against his name therein;

(*d.*) Whose name has been omitted from such electoral lists, and who claims to be entitled to have a vote or votes for any ratable land for which the name of some other person is entered in such lists, may likewise apply to the town clerk to have his name substituted for the name of such other person.

The mayor shall cause lists to be made showing the names and addresses of the several persons claiming to have their names inserted on such electoral lists, or to have the amount of the ratable value of the lands set against their names on such electoral lists altered, and the particulars of such claims; and also of the persons whose names, or the ratable value of whose lands have been duly objected to as aforesaid; and shall cause a copy of every such list, with appropriate headings to the same, showing the contents thereof, to be affixed on some building in each ward on or before the third day of October in each year.

Revision Court.—The council shall hold an open Revision Court within the municipality for the purpose of revising the electoral lists, such revision to take place at such time and place as the mayor shall appoint, between the tenth and twentieth days of October (both inclusive) in each year; the mayor shall give six clear days' notice of the holding of such Court by placing such notice on some building within the municipality, and by advertisement in some newspaper. The Court shall consist of the mayor of the municipality, or, in his absence, of a chairman appointed by the other members of the Court, and of not fewer than one-third of the councillors.

The Revision Court shall have authority to hear, receive, and examine evidence, and, by summons, under the hand of the mayor, require all persons as the Court may think fit to appear personally before such Court, at a time and place to be named in such summons, and to produce to such Court all books and papers in their possession or under their control as may appear necessary for the purpose of their examination; and the said Court shall have the like powers for compelling the attendance of witnesses summoned, and their examination upon and taking of oaths and affirmations, and their answering questions touching the premises as by any law in force for the time being is vested in Justices exercising summary jurisdiction; and the mayor may issue any such summons at any time after he has appointed a time for holding the Court, and the Court shall, by the decision of the majority, determine upon the validity of all claims and objections, and any person failing to obey the summons of the said Court shall be liable to a penalty not exceeding Ten pounds, recoverable before *any two Justices.*

Digitized by Google

The Revision Court shall insert in the voters' list under revision the name of every person who has claimed, and is proved to the satisfaction of the Court to be entitled, to be inserted in the voters' list for one or more votes, and shall retain on the said list the names of all persons to whom no objection has been duly made, and the number of votes set against the same unaltered, and shall also retain on the list the name of every person who has been objected to by any person, and the number of votes set against the same unaltered, unless the person so objecting appears by himself, or by someone on his behalf, in support of such objection, and proves the service of the requisite notices; and when the name of any person inserted in any list, or the number of votes set against the same, has been duly objected to, and the person objecting appears by himself or by someone on his behalf in support of such objection, the Court shall require proof of so much of the qualification of the person so objected to as is embraced in the grounds of objection and no more: and in case the qualification of such person is not proved to the satisfaction of the Court, the Court shall expunge the name of such person from the said list, or shall alter and correct the number of votes set against the same, as the case may require; and the Court shall also expunge the name of every person who is proved to be dead, and shall, by means of inspection of the voters' list, rate-book, and valuation and return, correct any mistake, or supply any omission which may appear to such Court to have been made in any of the said lists in respect of the name, place of abode, or trade or occupation of any person who is included therein, or in respect of the local description of the ratable property, or the situation or the ratable value thereof: Provided always, that no person's name shall be inserted by the Court in any such list, or shall, except in case of death, be expunged therefrom, unless notice has been given as is hereinbefore required in each of the said cases.

Certificate of revised Voters' List.—The mayor shall, in open Court, write his initials against the name struck out or inserted, and against any part of the list in which any mistake shall have been corrected or omission supplied; and shall also initial every page of the list so settled, and shall then cause to be written at the foot or end of the list a certificate that the same has been revised and is correct, with the date thereof; and the mayor, and not fewer than two other members of the Court, shall severally sign such certificate.

Electoral Roll.—The list so signed and certified shall be delivered to the town clerk, who shall copy the names of the electors in alphabetical order in a roll or book, and shall prefix to every name a number, beginning such numbers at the first name on the roll with the number one, and continuing them on in regular arithmetical series to the last name thereon, and shall cause a sufficient number of copies of the roll to be printed, and shall sign and deliver the said roll to the mayor of the municipality.

Digitized by Google

The printed roll, so signed as aforesaid, shall be the ward electoral list or roll and municipal list or roll respectively for the municipality, and shall continue in force until new lists or rolls have been made for the municipality, under the provisions of the Act, whether the same have been duly made at the time hereby appointed or afterwards.

New Municipalities.

In the case of any newly proclaimed municipality where there is no council, the acts and things by the Municipal Act required to be done in and about the preparation, settling, and revision of the electoral lists, shall be done by such person or persons at such time or times and at such place or places as the Governor may appoint; and the Governor may also appoint and fix the date on or before which the prescribed applications and objections, may be lodged in respect of such lists, and may substitute for the prescribed dates, such other dates as he may think fit, to embrace the same periods of time as therein specified.

Time of holding Elections.—A first election of mayor, councillors, and auditors in any newly constituted municipality shall be held on such day, not less than forty days after the constitution thereof, as the Governor may appoint, and all subsequent elections as hereinafter appointed.

In every municipality an annual election of mayor, auditors, and councillors shall be held on the third Wednesday in November in each year, at such place or places within the municipality as the returning officer at such election shall appoint.

At the annual election, except in those cases for which other express provision is made, one-third of the whole number of councillors for the time being assigned to the municipality and the mayor and auditors shall be returned, and, in case of a municipality divided into wards, the councillors shall be returned in equal numbers for every ward.

On the occurrence of any extraordinary vacancy in the council of any municipality, a mayor, councillor, or auditor shall be returned to fill such vacancy on the day appointed hereunder for holding an election to fill the same.

THE COUNCIL.

The council shall hold two meetings of ratepayers within each year, namely, in the months of May and November; that held in the month of November, hereinafter called the annual meeting, shall take place at least one week before the day of the annual election; and also special meetings upon the requisition of at least one-third of the number of councillors, or upon the requ[illegible] in writing of twenty-one ratepayers.

Digitized by Google

The council shall hold ordinary meetings for the transaction of general business at the office of the council on such day and hour in each week, or such other time, at least once in each month, as the council shall from time to time appoint.

The mayor may call a special meeting of the council as often as he thinks proper, and shall call such meeting on receiving a requisition for that purpose, signed by at least one-third of the number of councillors; or, if he refuses or delays to call such meeting after receiving such requisition, the councillors signing such requisition may call such meeting, but in that case at least twenty-four hours' notice shall be given to each councillor, signed by the person or persons calling the meeting, and stating therein the business to be transacted.

The council may from time to time appoint a committee or committees of councillors, of which the Mayor shall *ex officio* be a member, and may fix the quorum for any such committee, and may delegate to any such committee or committees such of its powers and duties as it thinks fit, and may from time to time make such rules as it thinks fit for the guidance of such committee or committees, and may from time to time remove any members thereof, and appoint in the stead of them or any of them other councillors. A member of any committee may resign, and the resignation shall be complete on the same being handed to the town clerk.

A committee may appoint a sub-committee of its members to execute and discharge any of the powers and duties of such committee; but the acts of such sub-committee shall be submitted for approval to the committee by which such sub-committee is appointed.

Principal and more important Powers of the Council.

By-Laws.—The Council has powers to make by-laws for the Municipality subject to the provisions of the Municipal Act, and may from time to time alter, modify, amend, or repeal such by-laws. The specific purposes for which by-laws may be made are enumerated in the Act, and generally apply for more effectually regulating, observing, and carrying out all the powers and authorities given to the Council by the Act, and for insuring the good rule and government of the Municipality, and the convenience, comfort, and safety of the inhabitants, and for the prevention and suppression of nuisances. Any by-laws may be limited in their application to any portion of the Municipality, or to any catchment area, water supply, or other area under the control or jurisdiction of the Council.

Licenses.—The council may, subject to such conditions as it deems fit, grant licenses to persons for any of the following purposes, within a municipality:—

(*a.*) For the erection and use of bathing-houses, sheds, or machines;

Digitized by Google

(*b.*) For carrying on the trade of cow-keepers, dairymen, or purveyors of milk;

(*c.*) For keeping and depasturing goats and keeping pigeons;

(*d.*) For the hawking of fruit, fish, and vegetables, or any article of merchandise;

(*e.*) For movable or temporarily fixed stalls in or near any street for the sale of meat, fruit, vegetables, drink, eatables, or articles of merchandise;

(*f.*) For the driving and keeping of passenger vehicles tram and motor cars, wagons, drays, carts, or other vehicles for the carrying of goods and merchandise;

(*g.*) For the removal of the contents of any drain, water-closet, earth-closet, privy, cesspool, ashpit, or other place used for a similar purpose, or of any noxious or offensive matter;

(*h.*) For the erection or use of slaughter-houses;

(*i.*) For carrying on the trade or calling of a chimney-sweep;

(*j.*) For driving and depasturing horses, sheep, cattle, pigs, goats, camels, asses, or mules over and upon park lands and public reserves;

(*k.*) For the use and employment of hand-carts in streets or ways;

(*l.*) For keeping and maintaining any suitable premises as a bazaar or repository for the sale therein of horses, cattle, carriages, and other vehicles, or any of them, respectively, as the council may deem proper;

(*m.*) For the appointment of general porters;

(*n.*) For the erection in any public place of one or more machines or engines with a suitable house or building thereto, for the weighing of vehicles conveying any goods or merchandise whatsoever;

(*o.*) For the carrying on the trade or business of a condenser of water;

(*p.*) The council may grant licenses under the Cart and Carriage Licensing Act, 1876;

(*q.*) For the posting of bills or painting advertisements upon buildings, fences, verandahs, or any other place abutting upon, or facing into any street or way;

(*r.*) For the *opening of streets*, ways, or footways;

Digitized by Google

(*s.*) For the cutting, collecting, or removing of timber, firewood, stone, or other material from or on public reserves or commons.

And the council may fix the fees for all such licenses, and may prohibit the doing by unlicensed persons of any act or thing for which a license may be granted under the provisions of the Act, and any unlicensed person doing such act or thing shall be guilty of an offence against the Municipal Act, summarily punishable upon conviction before two Justices of the Peace, and shall be liable to pay any sum not exceeding Twenty pounds for every such offence.

Noxious Trades.—When any occupation or business, established within any municipality, becomes, and is of so offensive a nature as to be a public nuisance, the Council may agree with the person or company carrying on such offensive occupation or business not to carry on the same, or, so far as lies in the power of such person or company, permit the same to be carried on within the municipality, or within such distance from the boundaries of the municipality, as may be agreed upon in such contract, and the Council may give out of the municipal fund to such person or company such reasonable compensation by way of consideration for such contract as may be agreed upon between the contracting parties.

Dancing Saloons.—The Council may, on the application of twenty householders, resident in the immediate neighbourhood, license any room or saloon not licensed under "The Wines, Beer, and Spirit Sales Act, 1880," or its amendments, as a dancing room or saloon where payment may be received for admission, the Council prescribing the conditions and fees for such license.

Lands and Property.—All lands, tenements, premises, and property of every description whatsoever vested in, belonging to, or under the care, control, or management of any Council, shall so continue.

Any Council may, with the consent of the Governor, sell and convey in fee simple, or for any lesser estate, any lands purchased for value or acquired by such municipality from the Sovereign in Council, or any other person, which are not, in the opinion of the Council, required for the purpose of any undertaking for which the same were purchased.

Any Council may also let or lease any lands granted by the Crown, or any reserves or commonages for the holding of sports, on terms and conditions laid down by the Council; should, however, the length of the lease exceed three years, the consent of the Governor must be obtained.

Contracts.—The Council may, in the name and on behalf of the Municipality, enter into contracts for the purposes of the *Municipalities Act*, and every such contract may be made, varied, or discharged as prescribed by the Act.

Digitized by Google

Power to take Land for Works and Undertakings.—Subject to the provisions of the Municipal Act the Council may, with the consent of the Governor, take land compulsorily within the Municipality for the purpose of executing any of the works and undertakings authorised by the Act.

Dedication of Public Highways.—The Council may request the Governor to declare any land reserved, used, or by purchase or exchange acquired for a street or way, to be a public highway, and it shall be lawful for the Governor on such request, by notice in *Government Gazette*, to proclaim such highway absolutely dedicated to the public.

The Making, Maintenance, and Management of Streets, Bridges, Ferries, Water-courses, etc.—The Council may make, improve, maintain, alter, level, grade, extend, pave, light, water, cleanse, repair, keep in good order and condition, and otherwise improve all public places, streets, ways, bridges, culverts, jetties, ferries, wharves, and other premises within the Municipality; and may plant and maintain trees on public places and streets or ways, as seem proper; and may make and keep in good order and condition all sewers, gutters, drains, and water-courses along or under the said public places, streets, ways, wharves, and jetties, for carrying off the water, mud, or other filth, and again remove or alter the same as occasion requires; and may place bars and other fences across or along the said public places, streets, ways, wharves, or jetties, when under or preparatory to their alteration or repair, and may erect posts or railings, and suspend chains for guarding footways, gutters, or the like, and generally may do and make or cause to be made and done all acts and things whatsoever that are necessary and proper for accomplishing the several purposes aforesaid. The Council may also, subject to the provisions of the Act, open new streets and roads, use steam road rollers on any road, cause streets to be watered, close roads for repair, impound cattle, make water-courses, assign numbers to each house, give consent to posting bills, etc., in any public place, lease ends of streets for wharves, etc., etc.

Fixing the Level of Streets, Ways, Private Streets, Filling up low Ground.—The Council may fix, raise, sink, or otherwise alter the alignment or level of any street, cause footways to be flagged, kerbed, and paved at expense of owner, determine the width of all footpaths, fix crossing places over footpaths on either side of any street, improve park lands, appoint and fix carriage stands, etc., etc.

Sewerage.—The Council may cause necessary sewers or drains to be made under the streets or ways, but are responsible that all such sewers or drains be kept so as not to be a nuisance or injurious to health.

Lighting.—The Council may, by contract or otherwise, cause the streets and public places to be lighted with gas, oil, electric light or *otherwise during such times* as are requisite, provid

Digitized by Google

no contract for the supply of light for a term exceeding three years shall be made without the consent of the Governor.

Water Supply, Fires.—The Council may restrain anyone from the draining of lakes, etc., to the public injury, and may construct and maintain dams, tanks, and reservoirs, cause reservoirs, tanks, mains, pipes, and fireplugs to be constructed or laid down, to secure a constant and ample water supply in case of fire, establish fire brigades, and equip such with necessary machinery.

Baths, Wash-houses, etc.—The Council may erect buildings to be used as public baths and wash-houses, and make by-laws in connection with their use; construct fountains, urinals, and privies in or upon any public place, and manage any fountain or water-course which is surrendered to the Council for public use.

Pounds and Abattoirs.—The Council may construct and erect buildings, fences, and appliances necessary for pounds and abattoirs, and may lease or purchase land necessary for such purposes, and may make by-laws for all purposes connected therewith.

Weighbridges and Markets.—The Council may erect or authorise to be erected weighbridges in the municipality, provide market places, and construct market houses or other conveniences for the purpose of holding markets; provide houses and places for weighing carts; make convenient places for weighing carts; make convenient approaches to such markets; with the consent of the Governor, lease markets for any term of years; and provide all matters and things necessary for the convenient use of such markets and weigh-bridges.

Striking Rates.—The Council may order a General Rate to be struck when found to be necessary, but not to exceed 1s. 6d. in the £ in any one year upon the annual value of ratable land.

Finance.

Annual Estimates.—In November in each year the Council shall prepare two statements in writing, signed by the mayor, the one showing the various works and improvements which have been effected during the current year, and the other showing those which are proposed to be executed during the year next ensuing, and the estimated cost thereof. In the month of December in each year the Council may determine how far, if at all, they will adopt the statement last mentioned. The Council may also during that month estimate, as nearly as may be, the amount which will be required to meet the liabilities of the municipality, and to carry out the plan for the ensuing year, and otherwise to carry into effect the provisions of the Municipal Act, and how far the sources of its ordinary income, independently of rates, will be sufficient for that purpose, and what sum will be required to make up the deficiency, if any, found to exist on comparing the sum required with the estimated revenue of the municipality, independently of rates. After ascertaining such sum the Council shall order a rate to be struck, not exceeding 1s. 6d.

Digitized by Google

in the pound in any one year, upon the annual value of all ratable property to make good such deficiency, such rate to be called the "General Rate." The Council of any newly-proclaimed municipality may exercise the powers and carry out the duties and obligations granted to and imposed upon a council as soon after their election as may be practicable, having regard to the intervals of times respectively assigned for the doing of any act under the provisions of the Municipal Act; and the council of any such newly-proclaimed municipality may therefore prepare a statement and estimate in respect of the remaining period of the then current year, and any rate struck by such council shall be payable only in proportion to the unexpired period of the year.

Funds and Revenues.—The ordinary income of a municipality shall be made up of—

The rents, issues, profits, and dues arising from or out of any real or personal property of whatsoever description belonging to the municipality, together with any fines or penalties that are payable in consequence of any injury done to the same;

Fees, profits, or rents arising from or out of any land, reserves, or commonages;

All dues and fees authorised by the Governor to be exacted in respect of any building, erection, or work placed by the Governor under its control or management;

All fees for licenses granted;

All fees for licenses and registrations, which by any Act or Ordinance are granted, or the fees whereof are made payable to any Municipality or Town Trust;

All fines and penalties which by any Act or Ordinance are made payable to any Municipality or Town Trust, excepting so much as is payable to any informer;

All fines and penalties incurred and recovered under the provisions of "The Police Act, 1892," within the Municipality, excepting so much as is payable to any informer;

All fines and penalties that are incurred and recovered under the provisions of the Act, within the Municipality;

All moneys payable in respect of any general rate struck under the provisions of the Act.

In addition to the income as above raised, the Government at present allows a subsidy of 15s. in the £ for rates collected to the amount of £20,000, and 10s. in the £ above that amount.

Valuation.—The Council may, before or in the m December in each year, make a valuation of all ratable

Digitized by Google

the principles set out in the Municipal Institutions Act, and every such valuation shall remain in force until a fresh valuation has been made.

No.	Name of Municipality.	Valuation of Ratable Property in force for Year 1899-1900.			
		Annual Value.			
		Date when Completed.	Improved Property.	Unimproved Property.	Total Annual Value.
			£	£	£
1	Albany	Dec. 14, 1899	24,384	5,500	29,884
2	Beverley	Dec., 1898	636	796	1,432
3	Boulder	Nov. 15, 1899	61,288	2.196	63,484
4	Broad Arrow... ...	Feb. 10, 1900	*a*	*a*	8,144
5	Bulong	Nov. 23, 1899	4,922	965	5,887
6	Bunbury	Dec. 15, 1899	18.846	3,040	21,886
7	Busselton	Oct. 27, 1899	2,935	110	3,045
8	Carnarvon	Dec., 1896	*a*	*a*	1,600
9	Claremont	Dec. 5, 1899	11,321	11,210	22,531
10	Coolgardie	Nov. 20, 1899	54.748	1,790	56,538
11	Cossack	Dec. 18, 1899	2,438	162	2,600
12	Cue *b*	...	...	...	...
13	Day Dawn	Dec. 13, 1899	2,673	170	2,843
14	Esperance *b*	...	...	...	...
15	Fremantle	Dec. 15, 1899	102,211	9,607	111,818
16	Fremantle, East ..	Nov., 1899	*a*	*a*	18,269
17	Fremantle, North ...	Dec. 10, 1899	16,020	4,061	20,081
18	Geraldton	Dec. 4, 1899	19,640	2,851	22,491
19	Gingin	April 13, 1899	579	457	1.036
20	Guildford	Dec. 13, 1899	7,525	2,980	10 505
21	Helena Vale	Oct. 30, 1899	*a*	*a*	15,697
22	Kalgoorlie *b*	...	...	...	...
23	Kanowna *b*	...	...	...	...
24	Leederville	Nov. 2, 1899	*a*	*a*	14,521
25	Leonora *c*	...	...	..	...
26	Malcolm *c*	...	...	...	...
27	Menzies	Dec. 5, 1899	*a*	*a*	19,635
28	Mount Magnet ...	Oct., 11, 1899	6,079	366	6,445
29	Mount Morgans *c* ...	...	...	...	...
30	Nannine	Dec. 19, 1899	2,475	272	2,747
31	Newcastle	Dec. 18, 1899	*a*	*a*	2,875
32	Norseman	Dec. 1, 1899	7,519	1,211	8,730
33	Northam	Dec. 20, 1899	13,021	4,450	17,471
34	Perth	Dec. 15, 1899	*a*	*a*	286,083
35	Roebourne	Dec. 19, 1895	2,724	388	3,112
36	Southern Cross ...	Dec. 16, 1899	5,342	727	6,069
37	Subiaco *b*	...	...	...	...
38	Victoria Park *b* ...	...	...	...	...
39	York *b*	...	...	...	..

Notes.—*a* Not specified. *b* No returns furnished when applied for. *c* Not in existence long enough to supply returns for the year 1899-1900.

Digitized by Google

Actual Revenue of Municipalities for the Financial Year ended 31st October, 1900.

No.	Name of Municipality.	Total Rates.	Total Grants.	Licenses, Sanitation, etc.	Total Revenue.
		£	£	£	£
1	Albany	2,581	1,459	725	4,765
2	Beverley	62	37	10	109
3	Boulder	3,969	3,291	6,856	14,116
4	Broad Arrow	496	740	94	1,330
5	Bulong	346	885	44	1,275
6	Bunbury	1,840	919	289	3,048
7	Busselton	150	1,373	112	1,635
8	Carnarvon	165	29	238	432
9	Claremont	1,038	1,230	209	2,477
10	Coolgardie	3,852	3,164	2,155	9,171
11	Cossack	85	266	40	391
12	Cue *a*	...	...	...	...
13	Day Dawn	134	214	48	396
14	Esperance	284	369	64	717
15	Fremantle	11,976	3,800	4,520	20,296
16	Fremantle, East	1,303	1,559	3,348	6,210
17	Fremantle, North ...	2,039	1,781	1,271	5,091
18	Geraldton	2,228	1,157	512	3,897
19	Gingin	51	41	24	116
20	Guildford	602	1,927	156	2,685
21	Helena Vale	1,109	791	75	1,975
22	Kalgoorlie	9,574	5,655	26,882	42,111
23	Kanowna	1,684	901	882	3,467
24	Leederville	1,305	2,104	355	3,764
25	Leonora *b*	...	...	...	...
26	Malcolm *b*	...	...	...	...
27	Menzies	1,461	1,420	757	3,638
28	Mount Margaret	439	267	134	840
29	Mount Morgans *b* ...	...	...	...	...
30	Nannine	62	159	20	241
31	Newcastle	149	324	86	559
32	Norseman	612	266	239	1,117
33	Northam	1,559	1,308	447	3,314
34	Perth	27,838	18,219	18,370	64,427
35	Roebourne	122	83	134	339
36	Southern Cross	330	215	647	1,192
37	Subiaco	1,850	1,595	9,118	12,563
38	Victoria Park	992	2,264	178	3,434
39	York *a*	...	..	...	...

a No return furnished when applied for. *b* Not in existence long enough to supply returns for 1899-1900.

Digitized by Google

Actual Expenditure of Municipalities during the Year ended 31st October, 1900.

No.	Name of Municipality.	Works and Improvements (including Salaries and Wages in direct connection therewith, and cost of Material, etc.).	Disbursements in respect of Loans (interest and contribution to Sinking Fund).	All other Expenditure.	Total Expenditure.
		£	£	£	£
1	Albany	2,752	818	1,290	4,860
2	Beverley	32	...	64	96
3	Boulder	9,168	1,199	5,051	15,438
4	Broad Arrow	549	...	589	1,138
5	Bulong	403	...	452	855
6	Bunbury	1,106	457	1,140	2,703
7	Busselton	440	...	292	732
8	Carnarvon	80	...	301	381
9	Claremont	918	220	1,282	2,420
10	Coolgardie...	5,113	...	5,425	10,538
11	Cossack	212	...	199	311
12	Cue *a*	...	...	...	...
13	Day Dawn	106	...	330	436
14	Esperance	371	...	300	671
15	Fremantle	7,746	4,009	6,178	17,933
16	Fremantle, East	4,176	150	2,440	6,766
17	Fremantle, North ...	1,987	422	2,378	4,787
18	Geraldton	1,408	1,163	1,192	3,763
19	Gingin	59	...	58	117
20	Guildford	1,858	...	1,008	2,866
21	Helena Vale	904	...	1,073	1,977
22	Kalgoorlie	20,600	3,794	9,025	33,419
23	Kanowna	801	50	1,918	2,769
24	Leederville	3,384	796	824	5,004
25	Leonora *b*	...	...	...	...
26	Malcolm *b*	...	...	...	...
27	Menzies	1,035	...	3,868	4,903
28	Mount Magnet	487	...	299	786
29	Mount Morgans *b* ...	...	...	...	...
30	Nannine	46	...	241	287
31	Newcastle	243	...	205	448
32	Norseman	223	...	583	806
33	Northam	1,289	197	1,791	3,277
34	Perth	37,263	9,571	24,525	71,359
35	Roebourne...	211	...	166	377
36	Southern Cross	260	...	641	901
37	Subiaco	5,327	32	2,251	7,610
38	Victoria Park	5,182	210	853	6,245
39	York *a*	...	...	...	...

a No Returns supplied when applied for. *b* Not in existence long enough to furnish Returns for 1899-1900.

Digitized by Google

Loans.--Subject to the provisions of "The Municipalities Act, 1900," the Council of a Municipality may borrow money on the credit of such Municipality for permanent works or undertakings, or to liquidate the principal moneys owing by the Municipality on account of any previous loan.

The amount of money so borrowed at any time for permanent works or undertakings must not exceed ten times the average net ordinary annual income of the Municipality for the two years terminating with the yearly balancing of accounts next preceding the *Gazette* notice of such loan, or in the case of any Municipality already indebted, the difference obtained by subtracting from ten times such average net income the balance remaining unpaid of any previous loans. The amount of moneys borrowed to liquidate any loan must not exceed the balance of principal moneys owing on account of such loan.

The works and undertakings specified below shall be deemed permanent works and undertakings within the meaning of the Act, viz.:—

(1.) The opening, making, paving, or partial paving of streets and footways, the diverting, altering, or increasing the width of any streets or footways or the kerbing thereof.

(2.) The raising, lowering, or altering of the ground or soil of any streets.

(3.) The construction, purchase, and establishment of bridges, culverts, ferries, wharves, and jetties.

(4.) The construction, enlargement, and alteration of sewers and drains, and works connected with sewerage and drainage, and the purchase or erection of machinery for the treatment of refuse.

(5.) The construction and purchase of waterworks, or the procuring of a water supply by any means whatever.

(6.) The construction and purchase of tramways, motor-cars, gasworks and electric light plant, or any other works for lighting the municipality.

(7.) The construction and providing of municipal offices, pounds, abattoirs, market places, market houses, fountains, urinals, places for weighing carts and their loadings, and the making convenient approaches to markets.

(8.) The providing of baths and wash-houses.

(9.) The providing of pleasure grounds, libraries, museums and places of public resort and recreation.

Google

(10.) The purchase of land and materials, and the making of compensation to the owners of any land purchased for any of the foregoing purposes.

(11.) The purchase of organs and other musical instruments.

(12.) Erection of lamp-posts, lamps, and all necessary connections for lighting a municipality with gas or electricity or otherwise.

(13.) The construction, purchase, or erection of plant, pans, and appliances for the removal and treatment of nightsoil and refuse, or the application thereof to land for the purpose of manuring it.

(14.) The purchase of stone quarries, and construction or erection of machinery and plant in connection therewith.

(15.) The purchase of steam rollers and apparatus and appliances for watering streets, the purchase of land or buildings, and fire engines and any other appliances for preventing and extinguishing fires.

Provided that in respect of the matters contained in sections five and six the consent of the Governor shall be first obtained.

Digitized by Google

Municipal Loans, Amounts, Dates of Issue, Currencies, Rates of Interest, etc., Year 1899-1900.

No.	Name of Municipality.	Loan No.	Amount raised by issue of Debentures.	Date of issue.	Currency.	Rate of interest.	Purpose for which the Loan was raised.
			£		Y'rs.	%	
1	Albany *d*	1	4,000	25-5-86	28	6	Works.
			2,000	1-6-86	28	6	Town Hall.
			6,000				
		3	4,000	1-3-98	16	4½	Part redemption of Loans 1 and 2.
	Total—Albany ...	...	10,000				
2	Boulder	1	5,000	1-7-99	3	6	Providing Electric Light Plant.
3	Bunbury	1	600	20-9-97	20	4	Permanent Works.
		2	6,000	1-6-98	25	5	Do.
	Total—Bunbury...	...	6,600				
4	Claremont	1	2,000	20-2-99	15	6	Road Construction.
5	Fremantle *e* ...	1	500	18-4-83	27	5	Public Works.
			500	18-4-83	27	6	Do.
			1,000				
		5	5,000	31-7-89	20	5½	Roads.
		6	19,000	5-12-94	27	5	Repayment of Loans 2 and 3 and New Works.
		7	35,000	27-7-97	27	4	Repayment of Loan No. 4 and Public Works.
	Total—Fremantle	...	60,000				
6	Fremantle, East ...	1	3,000	1-10-99	21	5	Town Hall and Works.
7	Fremantle, North...	1	6,000	1-9-98	15	5	Construction of various streets.
8	Geraldton	1	4,000	June, 1889	20	6	Roads and Fire Engine.
		2	6,500	Jan., 1897	20	4½	Roads, Machinery, and Sanitary Plant.
	Total—Geraldton	...	10,500				

d Original amount of No. 1 Loan was £9,000, £3,000 of which was paid off during 18[illegible] was also *repaid during the same year.* *e* Loans Nos. 2, 3, and 4 have be[illegible]

Google

Municipal Loans, Amounts, Dates of Issue, Currencies, Rates of Interest, etc., Year 1899-1900 – continued.

No.	Name of Municipality.	Loan No.	Amount raised by issue of Debentures.	Date of issue.	Currency.	Rate of interest.	Purpose for which the Loan was raised.
			£		Yrs.	%	
9	Kalgoorlie	1	10,000	7-2-98	5	6	Purchase and Installation of Electric Light Plant.
		c 2	a 15,000	...	...	...	Electric Light Extension; Swimming Baths and Works.
	Total—Kalgoorlie	...	25,000				
10	Kanowna	1	b 1,000				
11	Leederville ...	1	7,500	1-7-99	20	6	Road making.
12	Northam	1	3,000	19-6-97	10	4½	Works.
13	Perth f	1	3,000	16-5-81	27	6	Road Construction, Lamps, Tar-paving, Public Baths, Municipal Yard, Plant, Parks and Reserves, etc.
			1,500	2-9-81	27	5	
			1,500	16-11-81	27	5	
			6,000				
		2	1,400	15-5-82	27	5	
			2,500	16-11-82	27	5	
			2,100	15-5-84	27	6	
			6,000				
		3	4,000	15-11-85	27	6	
			1,900	2-3-87	27	6	
			2,100	2-9-87	27	6	
			8,000				
		4	10,000	6-4-88	27	5	
		5	15,000	1-7-93	27	5	
		6	30,000	25-4-97	27	5	
		7	80,000	20-4-99	30	4	
	Total—Perth ...	...	155,000				
14	Subiaco c	1	b 8,000				
15	Victoria Park ...	1	3,500	1-9-99	15	6	Making and improving existing Roads.

a Taken from statement published by Municipality. b Taken from statement published in *Government Gazette*. c No return furnished when applied for. f Deposits to the amount of £4,610 had also been received prior to the 31st October, 1900, in respect of a loan of £25,000.

Sinking Funds.

When a Municipality has incurred a loan, a sinking fund shall be formed to liquidate the same, in the following manner:—

The Council shall, in every year after the issue of the debentures for such loan, cause a sum, not less than two pounds per centum of such principal sum, to be invested in the purchase of its own debentures, or consols, or Government stock of this State or of *any British* State or colony in Australasia, or on first mortgage on *freehold land*, in the joint names of the Colonial Treasurer and of *the Municipality*, until the complete liquidation of such loan.

Digitized by Google

MUNICIPAL LOANS—SINKING FUNDS.

No.	Name of Municipality.	Loan No.	Amount of Loan current on 31st October, 1900.	Accrued Sinking Funds in hands of Trustees on 31st October, 1900. Invested. Amount.	Invested. At rate %	Placed in Banks. Amount.	Placed in Banks. At rate %	Total.	Net Liability on Loan, 31st October, 1900.
			£ s. d.	£ s. d.		£ s. d.		£ s. d.	£ s. d.
1	Albany	1	6000 0 0	2360 0 0	3½	3 9 7	Nil.	2363 9 7	3636 10 5
		3	4000 0 0	240 0 0	3½	6 19 11	Nil.	246 19 11	3753 0 1
	Total Albany	...	10000 0 0	2600 0 0	...	10 9 6	...	2610 9 6	7389 10 6
2	Boulder a	1	5000 0 0	...	...	...	...	...	5000 0 0
	Total Boulder	1	5000 0 0	...	...	...	...	...	5000 0 0
3	Bunbury	1	600 0 0	12 0 0	3½	0 2 8	Nil.	12 2 8	587 17 4
		2	6000 0 0	120 0 0	3½	1 11 11	Nil.	121 11 11	5878 8 1
	Total Bunbury	...	6600 0 0	132 0 0	...	1 14 7	...	133 14 7	6466 5 5
4	Claremont	1	2000 0 0	100 0 0	3½	...	...	100 0 0	1900 0 0
	Total Claremont	...	2000 0 0	100 0 0	...	...	...	100 0 0	1900 0 0
5	Fremantle	1	1000 0 0	469 0 0	3½	4 6 4	Nil.	473 6 4	526 13 8
		5	5000 0 0	1366 0 0	3½	0 9 6	Nil.	1366 9 6	3633 10 6
		6	19000 0 0	2455 0 0	3½	4 8 6	Nil.	2459 8 6	16540 11 6
		7	35000 0 0	2150 0 0	3½	4 5 10	Nil.	2154 5 10	32845 14 2
	Total Fremantle	...	60000 0 0	6440 0 0	...	13 10 2	...	6453 10 2	53546 9 10
6	Fremantle, East	1	3000 0 0	...	...	...	...	...	3000 0 0
	Total Fremantle, East	1	3000 0 0	...	...	...	...	...	3000 0 0
7	Fremantle, North	1	6000 0 0	120 0 0	3½	2 0 6	Nil.	122 0 6	5877 19 6
	Total Fremantle, North	...	6000 0 0	120 0 0	...	2 0 6	...	122 0 6	5877 19 6
8	Geraldton	1	4000 0 0	2670 0 0	3½	5 1 0	Nil.	2675 1 0	1324 19 0
		2	6500 0 0	1010 0 0	3½	0 7 5	Nil.	1010 7 5	5489 12 7
	Total Geraldton	...	10500 0 0	3680 0 0	...	5 8 5	...	3685 8 5	6814 11 7

Amount of Sinking Fund shown in the Annual Statement of the Municipality, published in the *Government Gazette*, is £1,400. This amount was not in the

MUNICIPAL LOANS—SINKING FUNDS—*continued.*

No.	Name of Municipality.	Loan No.	Amount of Loan current on 31st October, 1900.	Accrued Sinking Funds in hands of Trustees on 31st October, 1900. Invested. Amount.	Invested. At rate %	Placed in Banks. Amount.	Placed in Banks. At rate %	Total.	Net Liability on Loan, 31st October, 1900.
			£ s. d.	£ s. d.		£ s. d.		£ s. d.	£ s. d.
9	Kalgoorlie	1	10000 0 0	4110 0 0	3½	0 2 2	Nil.	4110 2 2	5889 17 10
		2	15000 0 0	900 0 0	3½	...	Nil.	900 0 0	14100 0 0
	Total Kalgoorlie	...	25000 0 0	5010 0 0	...	0 2 2	...	5010 2 2	19989 17 10
10	Kanowna	1	1000 0 0	...	...	...	...	...	1000 0 0
	Total Kanowna	...	1000 0 0	...	...	...	...	...	1000 0 0
11	Leederville †	1	7500 0 0	...	...	...	...	...	7500 0 0
	Total Leederville	...	7500 0 0	...	...	...	...	...	7500 0 0
12	Northam	1	3000 0 0	120 0 0	3½	3 3 0	Nil.	123 3 0	2876 17 0
	Total Northam	...	3000 0 0	120 0 0	...	3 3 0	...	123 3 0	2876 17 0
13	Perth	1	6000 0 0	3445 0 0	3½	2 9 3	Nil.	3447 9 3	2552 10 9
		2	6000 0 0	3080 0 0	3½	1 18 3	Nil.	3081 18 3	2918 1 9
		3	8000 0 0	3090 0 0	3½	2 1 11	Nil.	3092 1 11	4907 18 1
		4	10000 0 0	3135 0 0	3½	3 5 0	Nil.	3133 5 0	6861 15 0
		5	15000 0 0	2305 0 0	3½	4 5 4	Nil.	2309 5 4	12690 14 8
		6	30000 0 0	2170 0 0	3½	3 11 1	Nil.	2173 11 1	27826 8 11
		7	80000 0 0	2415 0 0	3½	3 15 1	Nil.	2418 15 1	77581 4 11
	Total Perth	...	155000 0 0	19640 0 0	...	21 5 11	...	19661 5 11	135338 14 1
14	Subiaco	1	8000 0 0	..	...	...	...	...	8000 0 0
	Total Subiaco	...	8000 0 0	...	..	...	...	...	8000 0 0
15	Victoria Park	1	3500 0 0	...	...	...	...	...	3500 0 0
	Total Victoria Park	...	3500 0 0	...	...	...	...	...	3500 0 0

† The amount of Sinking Fund shown in the Annual Statement of the Municipality published in the *Government Gazette*, is £337 10s. This amount was not in the hands of the Sinking Fund Trustees on 31st October, 1900.

Digitized by Google

Accounts.—Every council shall cause the accounts of the municipality to be balanced half-yearly up to the thirtieth day of April and the thirty-first day of October in each year; and the auditors shall audit the said accounts as soon as conveniently may be.

An annual statement or summary, showing the financial position of the municipality at the end of October in each year, shall be prepared by the council, showing on the one side the amount received from each source of ordinary income, and from the special rate (if any) struck, and on the other the various matters and things on which such amounts have been expended; and in the case of any municipality that has borrowed any money during the year ending on the 31st day of October in any year, or has brought forward any borrowed money from the preceding year, a statement shall be made, showing on the one side all moneys so received or brought forward, and on the other the application of all such moneys as have been expended, and the amount remaining unexpended and to be carried forward; in the case also of any such municipality, a statement shall be made, showing on the one side the amount received from any special rate levied in respect of any loan as aforesaid, and on the other the application thereof, and also a statement with respect to each sinking fund, showing as to each of such funds the amount standing to the credit of the Colonial Treasurer and municipality. These several statements shall be audited by the auditors, and if found correct shall be certified as correct under the hands of the auditors.

The auditors shall, if they find any account or statement submitted to them for audit to be erroneous or deficient in any particular, unless such error or deficiency be at once made good by the person or persons liable to make it good, instead of signing such account or statement, forthwith make to the mayor a statement showing in what respects they have found such account or statement erroneous or deficient, and shall publish such statement in the *Government Gazette.*

(B.)—DISTRICT ROADS BOARDS.

The formation, construction, and maintenance of the public roads throughout the State, excepting those within the boundaries of a Municipality, is entrusted to the care of the Local Boards appointed to represent the several Roads Boards Districts into which the State is divided, and which it is optional for the Governor to designate, define, or alter, at any time, by notice in the *Government Gazette.*

During the year ended 31st December, 1901, seven Roads Board Districts were gazetted, viz.:—Broome, Upper Chapman, Melville, West Guildford, Upper Irwin, Mt. Magnet, and Phillips River.

During the same period one Roads Board District was gazetted a Municipality, viz., North Perth. There were 92 Roads Board Districts at the end of the year 1901.*

* Since then the Roads Board District of South Perth was gazetted a Municipality, reducing the total number of Roads Board Districts to 91.

Digitized by Google

The following is a return relating to Roads Boards for the Year ended 31st December, 1900, compiled from the Yearly Balance Sheets published in the *Government Gazette*, and from Returns supplied by the various Roads Boards :—

Area, Population, Valuation, etc., 1900.

No.	Name of Roads Board District.	Date on which present Boundaries were gazetted.	Estimated Population on 31st December, 1900.	Valuation. Net Annual Value.	General Rate in the £ levied during the year.	Total Revenue.	Total Expenditure.
				£	s. d.	£	£
1	Albany	10-4-96	*a*	...	...	1477	1423
2	Arthur	10-1-96	600	...	...	436	547
3	Arthur, West	14-9-00	160	...	...	364	381
4	Ashburton *b*	22-6-94	...	...	...	41	31
5	Augusta *b*	25-5-00	...	...	...	633	463
6	Bamboo	4-9-96	125	...	...	267	210
7	Bayswater	5-3-97	900	22027	0 9	1806	1657
8	Belmont	9-12-98	600	9000	0 8	1178	1108
9	Beverley	18-10-95	600	7975	0 3	418	330
10	Beverley, East	18-10-95	200	...	...	288	348
11	Blackwood, Lower	19-5-92	150	...	...	449	433
12	Blackwood, Upper	11-5-00	350	...	...	484	404
13	Broad Arrow	15-12-99	1150	8047	1 0	257	152
14	Broome Hill	19-5-92	380	...	...	561	416
15	Brunswick	14-9-00	2750	19717	0 6	981	912
16	Buckland Hill *b*	6-10-99	...	...	...	...	...
17	Bulong	22-12-99	800	...	...	643	546
18	Bunbury	14-12-94	1000	...	...	368	435
19	Bunbury, Suburban	26-5-99	400	3500	0 4	917	727
20	Canning	27-1-96	850	13246	0 7	1042	1216
21	Capel, Upper	9-6-99	400	...	...	387	470
22	Chittering	10-1-96	300	...	...	379	368
23	Claremont	4-10-95	500	7337	0 3	1339	1171
24	Collie	14-9-00	2000	...	...	1949	1668
25	Coolgardie	27-10-99	4100	12887	1 0	1507	1076
26	Coolgardie, North	5-8-98	*a*	31640	1 0	1296	1080
27	Coolgardie, North-East *b* ...	22-12-99	...	...	...	...	...
28	Cottesloe	25-5-00	1274	16582	0 9	1200	1407
29	Cue *b*	6-12-95	...	...	...	690	596
30	Dandaraga	27-2-90	280	...	...	242	289
31	Dardanup	14-9-00	2000	...	...	689	535
32	Darling Range	30-4-97	1400	20082	0 4	934	758
33	Drakesbrook	29-4-98	800	1762	1 0	613	680
34	Dundas	13-9-95	1000	3213	1 0	404	319
35	Esperance *b*	9-11-00	...	...	...	...	...
36	Fremantle	9-7-97	*a*	22700	0 9	5862	5563
37	Fremantle, East *c*	14-12-00	...	...	...	...	...
38	Gascoyne, Lower	9-2-93	300	...	...	254	241
39	Gascoyne, Upper	28-5-97	*a*	...	...	24	34
40	Geraldton *b*	25-1-71	...	...	...	...	...
41	Gingin	12-1-93	800	...	...	237	134
42	Goomalling	23-7-97	1575	...	...	489	365
43	Greenbushes *b*	2-2-00	...	...	...	530	528
44	Greenhills	15-12-92	329	...	...	332	325
45	Greenough	14-12-00	*a*	...	...	1081	698
46	Irwin	14-12-00	800	...	...	424	381
47	Jandakot	16-7-97	170	...	...	482	570
48	Kalgoorlie *b*	19-6-96	...	...	...	8431	4192
49	Katanning	19-5-92	1280	...	...	1138	883
50	Kelmscott *b*	14-12-94	...	...	...	...	...
51	Kimberley Goldfields	10-2-87 *d*	68	2106	0 9	327	334
52	Kimberley, West	10-2-87 *d*	300	...	...	510	302
53	Kojonup *b*	19-5-92	...	...	...	...	...
54	Meckering	14-12-94	600	...	...	746	615
55	Minilya	4-5-00	100	...	...	349	92
56	Moorabbin *b*	14-5-97	—	—	—	—	—

a Not stated. *b* No returns furnished when applied for. *c* Not working during 1900. *d* Date when boundaries were finally gazetted under "The District Roads Board Act, 1877" (34 Vict., No. 28).

Digitized by Google

Area, Population, Valuation, etc., 1900.—continued.

No.	Name of Roads Board District.	Date on which present Boundaries were gazetted.	Estimated Population on 31st December, 1900.	Valuation. Net Annual Value.	General Rate in the £ levied during the year.	Total Revenue.	Total Expenditure.
				£	s. d.	£	£
57	Moorumbine	6-7-94	375	...	...	367	579
58	Murchison	13-10-93	100	...	...	313	313
59	Murray	29-4-98	450	9000	0 3	741	790
60	Nannine	6-12-95	900	...	...	315	224
61	Narrogin *b*	22-2-95	...	...	...	...	...
62	Nelson	19-5-92	490	...	...	1013	863
63	Northam	18-9-96	*a*	...	...	503	496
64	Northampton...	10-2-87 *d*	795	...	...	877	769
65	Nullagine	8-7-98	350	...	...	535	492
66	Peak Hill	28-5-97	500	...	...	608	648
67	Peppermint Grove	6-10-99	532	9540	1 0	1277	1164
68	Perth	26-10-00	*a*	24882	0 6	1573	1216
69	Perth, North	26-10-00	1000	14512	0 9	2937	2825
70	Perth, South *b*	4-5-00	...	...	...	1056	1061
71	Phillips River *c*	9-11-00	...	...	...	...	...
72	Pilbara	8-7-98	*a*	...	...	344	181
73	Plantagenet	22-2-95	*a*	...	...	405	378
74	Preston *b*	10-7-96	...	...	...		...
75	Rockingham	5-2-97	250	...	...	527	442
76	Roebourne	22-6-94	*a*	...	...	651	612
77	Serpentine	27-11-96	2000	9630	0 6	804	811
78	Sussex	25-5-00	660	2222	*Nil*	935	536
79	Swan	30-4-97	5000	12785	0 3	729	555
80	Tableland	3-1-96	300	1539	0 3	377	222
81	Toodyay	23-7-97	*a*	...	...	749	821
82	Victoria Plains	23-7-97	660	...	...	452	430
83	Wandering	6-7-94	200	...	...	380	421
84	Williams *b*	14-9-04	...	...	...	...	...
85	Wyndham	10-2-87 *d*	84	...	...	105	211
86	Yalgoo	15-5-96	1000	...	...	541	433
87	Yilgarn	22-2-95	600	1361	1 0	562	476
88	York *b*	14-12-94	...	...	...	...	...

a Not stated. *b* No return furnished when applied for. *c* Not working during 1900. *d* Date when boundaries were finally gazetted under "The District Roads Boards Act, 1871" (34 Vict., No. 26).

Roads Boards, which must consist of seven persons, inclusive of the chairman, whom the members choose from amongst themselves, are elected by ballot by those ratepayers in the district whose names are on the Roads Board Electoral List, and each elector has a number of votes proportionate to the ratable value of the property owned or occupied by him in the district:—

If ratable value of property is £5 and not exceeding £10, 1 vote.
Exceeding £10 do. do. £25, 2 votes.
Do. £25 do. do. £50, 3 „
Do. £50 ... ... 4 „

Digitized by Google

Members are subject, of course, to disqualifications, which are almost identical with those connected with the election of a member of a Municipal Council, for which *see* page 392.

Any person whose name is on the existing electoral list, and who chooses to give the specified seven days' notice of his wish to become a candidate, is qualified both for election as a member of a Roads Board and as chairman.

Boards have (1.) the possession, care, control, management, construction, and repairs of all roads within the district; and all the bridges, drains, culverts, boundary posts, fences, and gates appertaining thereto are vested in, exercised, and affected by the Roads Board of such district;

(2.) The property and estate in the soil of all roads, and the bridges, drains, and culverts thereon, is vested in His Majesty His heirs and successors;

(3.) No Board can expend a sum exceeding £100 in the making, in the first instance, of a bridge or culvert, except by the direction and under the control of the Director of Public Works, or his deputy, duly authorised by him in that behalf.

The ordinary income of the Boards is derived from—

1. Rents, etc., from any land or property under their control.
2. Fees, rents, etc., arising from any public property with which they have been endowed;
3. Fees authorised by the Governor to be exacted from any ferry, jetty, wharf, etc., placed under the control of the Board;
4. Fees, licenses, fines, and penalties recoverable under any by-laws;
5. Fines and penalties incurred under "The Roads Act 1888";
6. Any general rate made and levied;
7. Any voluntary subscriptions of money or labour;
8. Grants from public funds of which, however, not less than three-fourths are to be spent on main roads.

As regards rates, Boards are authorised to make and levy a rate within the limits of their districts not to exceed One shilling in the £ in any one year upon the annual value of all ratable property within the district, and such rate shall be called a general rate.

All Boards are required to furnish an annual statement showing the financial position of the Board as on the 31st of December in each year, which statement, after being audited and certified to as correct, has to be published in the *Government Gazette* and a newspaper circulating in the district.

Digitized by Google

(C.)—LOCAL BOARDS OF HEALTH.

Municipal Local Boards of Health—Members, Health Rate, etc., for Year ended 31st October, 1900.

The following statistical information is given of the transactions of the various Local Boards of Health -Municipal and Extra-Municipal—gazetted under "The Public Health Act":—

No.	Name of Local Board of Health.	Date when Locality was first gazetted as being under the Public Health Act.	Date on which latest alteration of Boundaries was gazetted.	Government Subsidy.	Total Receipts.	Total Expenditure.
				£	£	£
1	Albany	26-1-88	...	...	196	225
2	Beverley *a* ...	6-3-96	...	...	...	...
3	Boulder	10-12-97	...	250	1,836	2,186
4	Broad Arrow ...	25-9-96	...	...	115	115
5	Bulong	14-8-96	...	...	480	433
6	Bunbury	24-4-93	...	100	571	574
7	Busselton	24-4-93	...	25	150	204
8	Carnarvon ...	4-5-93	...	100	236	196
9	Claremont... ...	2-4-97	...	...	90	92
10	Coolgardie ...	16-11-94	...	276	1,029	1,112
11	Cossack	8-12-93	...	...	136	136
12	Cue *b*	8-2-95	...	...	...	...
13	Day Dawn ...	10-5-95	19-1-1900	50	214	181
14	Esperance ...	8-5-96	...	...	39	46
15	Fremantle ...	*c* 20-8-86	29-6-1900	200	957	834
16	Fremantle, East ...	8-10-97	...	...	570	570
17	Fremantle, North	20-12-95	29-6-1900	...	687	686
18	Geraldton ...	5-5-92	...	...	1,293	1,293
19	Guildford	7-4-87	...	...	404	404
20	Helena Vale ...	31-1-96	...	...	805	964
21	Kalgoorlie ...	15-2-95	...	1,250	2,386	2,287
22	Kanowna	8-5-96	...	100	790	726
23	Leederville ...	4-9-96	...	...	227	227
24	Menzies	6-3-96	...	...	719	1,155
25	Mount Magnet ...	2-10-96	...	...	267	191
26	Nannine	29-11-95	...	100	189	81
27	Newcastle *a* ...	27-4-94	...	...	...	...
28	Norseman	25-12-96	...	...	419	575
29	Northam	24-4-93	...	...	536	538
30	Perth	*c* 20-8-86	...	...	13,906	12,353
31	Roebourne ...	21-11-89	...	...	155	154
32	Southern Cross ...	16-2-93	...	...	462	462
33	Subiaco	22-5-96	...	50	214	229
34	Victoria Park ...	17-7-96	...	...	132	136
35	York *b*	22-9-92	...	...	...	..

a Not working. *b* No Return furnished when applied for. *c* Date when "The Public Health Act, 1886," was assented to.

Digitized by Google

Local Boards of Health outside Municipalities.—Members, Health Rate, etc.

No.	Name of Local Board of Health.	Date when Locality was first gazetted as being under "The Public Health Act, 1886."	Date on which latest alteration of Boundaries was gazetted.	Government Subsidy.	Total Receipts.	Total Expenditure.
				£	£	£
1	Abbotts	16-12-1898	...	25	134	203
2	Bardoc *a*	20-11-1896	...	...	...	...
3	Bayswater	25-11-1898	...	...	287	300
4	Belmont	19-5-1899	...	...	27	*Nil*
5	Black Flag	13-11-1896	...	...	*Nil*	32
6	Bonnievale	22-7-1898	...	...	33	36
7	Bridgetown	13-5-1898	...	200	356	281
8	Brunswick	30-7-1897	...	...	*Nil*	41
9	Burbanks	19-5-1899	23-3-1900	50	124	116
10	Collie	10-9-1897	...	72	187	209
11	Cookernup	30-4-1897	...	...	3	47
12	Cottesloe	12-3-1897	...	...	118	120
13	Diorite King *a*	24-9-1897	...	...	...	...
14	Donnybrook	29-4-1898	...	200	250	81
15	Field's Find	12-8-1898	...	...	199	194
16	Fremantle Roads Board District	12-8-1898	...	...	86	*Nil*
17	Golden Valley *a* ...	8-7-1898	...	...	...	...
18	Goongarrie	27-11-1899	...	...	*Nil*	1
19	Greenbushes	30-6-1899	...	450	488	459
20	Gullewa	10-7-1896	...	...	115	130
21	Jarrahdale	30-3-1900	...	100	100	97
22	Karridale *a*	5-8-1898	...	...	...	...
23	Katanning	3-6-1898	...	...	119	110
24	Kookynie	15-12-1899	...	125	197	110
25	Kunanalling *a*	19-3-1897	...	...	...	...
26	Laverton *a*	11-4-1899	...	...	...	...
27	Lawlers	23-7-1897	...	...	667	667
28	Lennonville *a*	17-2-1899	...	...	...	...
29	Leonora	14-5-1897	25-5-1900	125	392	314
30	Malcolm	26-2-1897	...	125	664	605
31	Marble Bar Tinfields *a*	31-8-1900	...	...	...	...
32	Mertondale	18-8-1899	...	...	*Nil*	96
33	Mingenew	29-5-1896	...	50	52	18
34	Mount Ida	5-5-1899	...	50	76	78
35	Mt. Morgans	4-8-1899	...	50	449	447
36	Mulgarrie *a*	30-10-1896	...	...	...	...
37	Mullewa *a*	29-11-1895	...	...	...	...
38	Mulline *a*	4-12-1896	...	...	...	...
39	Mundaring *a*	15-7-1898	...	...	...	...
40	Niagara *a*	3-4-1896	...	...	...	...
41	Paddington *a*	1-1-1897	...	...	...	...
42	Paynesville *a*	6-5-1898	...	...	...	...
43	Peak Hill	29-1-1897	...	...	167	158
44	Pendinnie *a*	10-9-1897	...	...	...	...
45	Pinjarra	25-8-1899	...	...	7	14
46	Ravensthorpe *b*	29-6-1900	...	...	...	...
47	Red Hill	7-1-1898	...	50	60	53
48	Rothesay *b*	21-8-1896	...	...	...	...
49	Salgash *a*	4-11-1898	...	...	...	...

a **No return furnished when applied for.** *b* **Not working during 1900.**

Digitized by Google

Local Boards of Health outside Municipalities.—Members, Health Rate, etc.—continued.

No.	Name of Local Board of Health.	Date when Locality was first gazetted as being under "The Public Health Act, 1886."	Date on which latest alteration of Boundaries was gazetted.	Government Subsidy.	Total Receipts	Total Expenditure.
				£	£	£
50	Six Mile *a*	9-9-1898	...	...	...	...
51	South Perth *a*	11-6-1897	...	...	...	...
52	Tampa *a*	30-7-1897	...	...	...	...
53	Tuckanarra	29-6-1900	...	25	25	*Nil*
54	Wagin	3-6-1898	...	25	53	36
55	Wiluna *b*	12-8-1898	...	...	...	...
56	Windanya *b*	10-9-1897	...	...	...	...
57	Woodara *a*	13-5-1898	...	...	...	...
58	Wyndham *b*	10-6-1898	...	...	...	...
59	Yalgoo	17-4-1896	...	...	231	195
60	Yerilla *a*	31-7-1896	...	...	...	...

a No return furnished when applied for. *b* Not working during 1900.

(D.)—FIRE BRIGADES.

Returns relating to Fire Brigades for the Year 1900.

Revenue, Expenditure, and Estimated Value of Land and Buildings, and Plant.

No.	Name of Fire Brigade.	Government Grant.	Total Receipts.	Total Expenditure.	Estimated Value of Land and Buildings.	Estimated Value of Plant.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1	Boulder	300 0 0	300 0 0	72 0 0	400 0 0	50 0 0
2	Broad Arrow *c*	...	...	...	...	...
3	Bulong (Volunteer) ...	50 0 0	50 0 0	43 11 6	*a* 60 0 0	200 0 0
4	Bunbury	50 0 0	50 0 0	*Nil*	...	...
5	Coolgardie (Municipal)...	350 0 0	799 9 5	799 9 5	448 17 6	442 5 9
6	Cue (Volunteer)	50 0 0	135 4 5	109 12 11	*b* 25 0 0	460 0 0
7	Esperance (Volunteer) ...	50 0 0	70 0 0	66 14 2	...	608 4 11
8	Fremantle	200 0 0	509 18 4	486 11 8	1,000 0 0	900 0 0
9	Fremantle, North ...	50 0 0	100 0 0	94 15 8	200 0 0	300 0 0
10	Geraldton	100 0 0	129 7 2	129 7 2	75 0 0	1,193 19 7
11	Kalgoorlie (Volunteer) ...	350 0 0	397 15 6	259 9 0	760 0 0	420 0 0
12	Kanowna *c*	...	...	...	...	...
13	Menzies (Volunteer) ...	50 0 0	92 11 6	92 11 6	595 0 0	423 0 0
14	Norseman	200 0 0	318 11 0	318 11 0	150 0 0	100 0 0
15	Northam	50 0 0	87 17 11	58 18 7	70 0 0	378 4 6
16	Perth (Metropolitan) ...	300 0 0	2,703 3 0	3,306 18 2	10,000 0 0	1,500 0 0
17	Victoria Park (Volunteer)	75 0 0	143 5 0	125 4 8	...	102 0 0

a. Value of Buildings only. *b*. Land only. *c*. No Return furnished when applied for.

Digitized by Google

ISTRATION OF JUSTICE.

... Civil and Criminal Juris-
... Civil Act (24 Victoria,
... powers of the Courts of Queen's
... Westminster, and the
... All powers conferred
... Chancellor by any Act of
... previously to 1st June,
... circumstances of the
... Court so far as they are
... jurisdiction is confirmed by
... practically embodies the
... Acts

... jurisdiction in Divorce and
... extend to it the same powers
... Administration as that possessed
... England

... conferred by "The Bankruptcy
... With some few local differences,
... contained is that of the English

... ment Act, 1898" (62 Victoria,
... the Administration of Estates

... "The Insolvency Act, 1886," of
... change in the system prescribed

... psis of the Amendment Act:—
... original Act was amended by
... minimum amount before com-

... "Compositions and Assignments
... this section, a debtor may call a
... Court after the delivery of the
... on the application of a creditor
... may order that all legal pro-
... Court is also empowered at any time

... has the effect of staying all
... or meetings of the creditors.

... equivalent to seven-eighths in value,
... the creditors, may resolve to accept
... arrangement, subject to the approval
... resolve, if carried by a vote of
... in number, that the debtor shall
... a trustee to be named in such
... meeting may grant a warrant to
... debtor.

Digitized by Google

The deed from the debtor to the trustee must be assented to by three-fourths in value and one-half in number of the creditors, every creditor under £10 being recorded in value only.

Under the Act of 1892 the debtor was required to submit his proposal to the "Official Receiver," who called, and presided at, all meetings of the creditors.

The Full Court, as constituted by "The Supreme Court Act, 1880," and the Amending Act (50 Victoria, No. 28), now consists of three Judges, who sit together to hear and determine all appeals from a Judge, or from any order of the Supreme Court or Courts of inferior jurisdiction. By Order LV. of the Supreme Court Rules, it is provided generally that all appeals from Chambers; appeals and proceedings relating to election petitions (whether municipal or parliamentary); appeals from Justices; applications for New Trials, and proceedings on the Crown side of the Supreme Court shall be taken before the Full Court. This order, however, does not abridge the right of a Judge of the Supreme Court to hear and determine any matter which he had previously power to determine.

By the Administration of Justice (Civil) Act, the Supreme Court is constituted a Court of Oyer and Terminer and General Gaol Delivery in and for the State, with the same jurisdiction as to all pleas of the Crown, Prosecutions, and Informations as the High Court of Justice in England, and as Justices of Oyer and Terminer and General Gaol Delivery. The Supreme Court, in its Criminal Jurisdiction, sits monthly, except during the Long Vacation.

By the 9th Victoria, No. 4, provision is made for holding Courts of General Sessions of the Peace at such places as shall from time to time be appointed by the Governor. Such Sessions are now held quarterly at Albany, Broome, Bunbury, Cue, Coolgardie, Derby, Esperance, Geraldton, Kalgoorlie, Roebourne, and Wyndham, and in each case the Government Resident or Resident Magistrate is the Chairman of the Court. Such Courts have jurisdiction over all felonies not punishable with death, and all misdemeanours; and also have power to remit for trial before the Supreme Court, at Perth, any crime or offence which by its magnitude or nature ought to be so tried.

By the 50th Victoria, No. 15, the Supreme Court or any Court of Quarter Sessions may reserve for the Full Court any question of law arising on the trial.

The Governor has power to appoint a Special Commissioner to hear Criminal Cases and exercise the full jurisdiction conferred upon a Judge of the Supreme Court.

The Admiralty Jurisdiction of the Court is conferred by the Imperial Statutes 53 & 54 Vict., c. 27—"The Colonial Courts of Admiralty Act, 1890."

The Sheriff has jurisdiction over all the State, and is permanently appointed by the Governor.

Digitized by Google

Police Courts are held in all the districts. In Perth the Court is presided over by a Police Magistrate, and in other districts by Government Residents or Resident Magistrates. They sit daily, and deal with all minor offences against persons and property. Small Debts Courts are held monthly (except in Perth, Fremantle, and Southern Cross, where the sittings are held at shorter intervals), to hear and determine claims where the amount does not exceed £100. In each case the Police Magistrate, Government Resident, or Resident Magistrate is the Judge of the Court.

The Prison at Fremantle, which has been taken over from the Home Government, was formerly the Imperial Convict Establishment. There are, besides, ten common gaols situated in the country districts, where prisoners are kept awaiting trial or undergoing short sentences; and there is a penal establishment for aborigines at Rottnest.*

Subject to certain conditions an appeal lies from the Full Court to the Privy Council. These conditions are set forth in an Order in Council dated 11th October, 1861. This provides that an appeal shall lie from any judgment, decree, order or sentence of the Full Court where the subject-matter at issue shall exceed the value of £500, or where any claim or question concerning property or civil right is involved of a like amount. The Full Court may also grant leave to appeal from any preliminary or interlocutory order or judgment. No appeal can be brought in any other matter without the special leave of the Privy Council.

Supreme Court of Western Australia.

BARRISTERS' ADMISSION BOARD.

This Board was formed under the Legal Practitioners Act of 1893, and from time to time makes and prescribes all such rules as to the Board may seem meet:—

(*a.*) For fixing the time and regulating the annual election of the five practitioners on the Board.

(*b.*) For the examination from time to time of articled clerks and their conduct whilst under articles of clerkship.

(*c.*) For the admission, qualification, and examination of all candidates for admission as practitioners.

(*d.*) For regulating the investigation of charges of alleged misconduct of practitioners in connection with the practice of their profession, and for imposing conditions to be observed by applicants for re-admission and regulating such applications.

(*e.*) For regulating the meetings and proceedings of the Board.

(*f.*) For generally carrying into effect the objects of the Legal Practitioners Act.

* *It has been decided by the Government to abolish the penal establishment at Rottnest and remove the prisoners to other gaols, probably in the Northern Districts.*

Digitized by Google

Law students are required to pass a preliminary examination in the following subjects:—Arithmetic and Algebra (to and inclusive of quadratic equations), English Grammar, Analysis and Composition, Euclid (first two books), Outlines of English History from the Conquest to the present time, and Latin. In Latin applicants are examined in *Cicero (De Amicitia)* or *Virgil (Æneid, Book IV.)*, or such other works as the Board may from time to time direct.

The Board may dispense with the preliminary examination in favour of any candidate who has matriculated or graduated at, or passed in Western Australia the matriculation examination of, any University recognised by the Board in Great Britain or any of the Australian States.

Every student must serve under articles for five years, unless such person has taken the degree of Bachelor of Law at any University recognised by the Board in England or Ireland, or any of the Australian States, including Tasmania and New Zealand, in which case he need only serve for the full term of three years.

Every articled clerk must pass an intermediate examination in Stephens's "Commentaries" and Williams' "Real and Personal Property" (modified by local laws), and also a final examination in law in the following subjects:—Contracts and Torts, Real and Personal Property, Evidence, Criminal Law, Equity, Statute Law of Western Australia, Practice and Procedure in the Supreme Court of Western Australia, and any one of the following subjects:—Jurisprudence, Constitutional History, Roman Law, or International Law.

Every applicant for admission as a practitioner, unless a locally articled clerk, must, at least five calendar months before he applies to the Court for admission, lodge with the Secretary of the Board—

(*a.*) An affidavit with reference to the places where he has practised, as to the nature of his employment after the cessation of his former practice, and as to his conduct;

(*b.*) A certificate of his admission to practise in every Court in which he has been admitted to practise; and

(*c.*) A certificate from the Registrar or other proper officer of every Court in which he has theretofore been admitted to practise, or from the Treasurer of his Inn, that at the date of such certificate, not being more than four months prior to the date of such lodgment, the name of the applicant was still on the rolls of the Court or Inn, and that he had never at any time been struck off or suspended, nor been the subject of any complaint by any person to the Court or Inn, or to any committee or body having authority to deal with complaints against any person as a member of the Inn, or entitled to practise before any such Court (as the case may be); and

Digitized by Google

(*d.*) A certificate of two persons of repute who have known the applicant in the place wherein he was last practising out of the State, certifying that the applicant is well known to them, and in their opinion is a fit and proper person to be admitted as a practitioner in the Supreme Court of Western Australia.

Every applicant for admission as a practitioner must—

(*a.*) Lodge with the Secretary within one calendar month before he applies to the Court for admission a certificate of two persons of repute who have known the applicant in this State, certifying that the applicant is well known to them, and in their opinion is in every respect a fit and proper person to be admitted as a practitioner in the Supreme Court of Western Australia; and

(*b.*) During one calendar month immediately preceding the date of his application advertise twice a week in two daily papers published in Perth and in such other paper published elsewhere in the State, as the Board may direct, notice of his intention to apply for admission;

(*c.*) Pass an examination in the Statute Law of the State.

Victorian legal practitioners are not admitted to practise in the State, in consequence of there being no reciprocity between Victoria and Western Australia. New Zealand legal practitioners are not admitted to practise in the State unless they were admitted in their own Colony prior to the passing of the New Zealand Act (1882), which dispenses with the necessity for the serving of articles by students.

Practitioners, before admission to the Bar of the State, pay a fee of thirty guineas (in addition to the Supreme Court Stamp Fee of ten pounds and advertising charges of six guineas) to the Barristers' Board. Law students pay the following fees to the Board:—Before preliminary examination, twelve guineas; before intermediate examination, three guineas; before final examination, five guineas.

CIVIL SITTINGS, SUPREME COURT.

The Civil Sittings of the Supreme Court are eleven in each year, and commence on Tuesday after the 25th February (except when that day falls on a Tuesday, and then on that day), on the second Tuesday in the months of March to November, both inclusive, and on the first Tuesday in December. If the Civil Sittings fall on Tuesday before Easter, such sittings will not be held till Wednesday after Easter; and when any sittings would commence on a public holiday, they are held on the following day.

Action must be set down for trial within six days after giving *notice of trial.*

Digitized by Google

TIME FOR ENTERING APPEARANCE.

In Western Australia—

Not exceeding 200 miles from Perth	...	10 days.
Above 200 but less than 400 miles	...	16 „
„ 400 „ „ 600 „	...	21 „
„ 600 miles	...	30 „

Out of Western Australia—

Such time as Court or Judge may direct. The discretion of the Judge, so far as States in the Federation are concerned, is now limited by Section 6 of the Federal Council Act, 49 Victoria, No. 3.

FULL COURT.

The Sittings of the Full Court are five in every year, and commence on the third Tuesday in the months of March, May, July, September, and November, and on such other days or times as the Full Court may think fit.

CRIMINAL SITTINGS.

Criminal Sittings are held on the first Tuesday in every month, excepting January and February.

VACATIONS.

The Vacations observed in the Supreme Court are the Christmas Vacation, commencing on the 24th December and terminating on 25th February, and the Easter Vacation, commencing on Good Friday and terminating on Easter Tuesday.

No pleadings can be amended or delivered in the Christmas Vacation unless directed by a Court or a Judge.

HOLIDAYS.—SUPREME COURT.

The several offices of the Supreme Court are open on every day of the year except Sundays, Good Friday, Easter Eve, Easter Monday and Tuesday, Whit Monday, Christmas Day, and the next following working day, and on all days appointed by proclamation to be observed as days of general fast, humiliation, or thanksgiving, and every public holiday.

COURTS OF QUARTER SESSIONS.

Albany—Sits 3rd Wednesday in February, May, August, November.

Broome—Sits 1st Wednesday in February, May, August, and November.

Bunbury—Sits 3rd Wednesday in January, April, July, October,

Coolgardie—Sits 2nd Wednesday in March, June, September, December.

Cue—Sits 3rd Wednesday in February, May, August, November.

Derby—Sits 4th Wednesday in January, April, July, Oct

Digitized by Google

Esperance—Sits last Wednesday in February, May, August, November.

Geraldton—Sits 1st Wednesday in March, June, September, December.

Kalgoorlie—Sits 3rd Wednesday in March, June, September, December.

Roebourne—Sits 3rd Wednesday in March, June, September, December.

Wyndham—Sits 4th Wednesday in February, May, August, November.

Sittings Local Courts.

Place.	Date of Sittings in each Month.	Place.	Date of Sittings in each Month
Albany	2nd Wednesday	Marble Bar ...	1st Wednesday
Beverley ...	Last Thursday	Menzies ...	3rd Wednesday
Boulder ...	2nd Wednesday	Moora	2nd Tuesday
Bridgetown ...	Last Thursday	Mount Magnet	Do.
Broad Arrow ...	1st Wednesday	Mount Malcolm	1st Wednesday
Broome ..	1st Tuesday	Mount Morgans	3rd Monday
Bulong	2nd Monday	Nannine ...	4th Friday
Bunbury ...	2nd Tuesday	Narrogin ...	2nd Friday
Busselton ...	2nd Thursday	Newcastle ...	2nd Tuesday
Carnarvon ...	Do.	Norseman ...	2nd Wednesday
Collie	3rd Wednesday	Northam ...	1st Thursday
Coolgardie ...	1st Wednesday	Northampton	3rd Friday
Cue	Do.	Nullagine ...	2nd Monday in January, March, May, July, September, November
Derby	2nd Thursday		
Donnybrook ...	Last Wednesday		
Esperance ...	4th Monday	Onslow ...	1st Wednesday
Fremantle ...	2nd and last Monday	Peak Hill ...	1st Wednesday
Geraldton ...	2nd Tuesday	Perth	Every alternate Thursday
Gingin	3rd Thursday	Phillips River	3rd Tuesday
Greenbushes ...	2nd Monday	Pinjarra ...	1st Tuesday
Greenough ...	4th Wednesday	Roebourne ...	2nd Wednesday
Guildford ...	Last Tuesday	Southern Cross	1st and 3rd Friday
Hall's Creek ...	2nd Thursday	Victoria Plains	3rd Wednesday January, April, July, October
Irwin	4th Thursday		
Jarrahdale ...	2nd Tuesday	Vasse	*See* Busselton
Kalgoorlie ...	1st Wednesday	Wagin	3rd Friday
Kanowna ...	1st Thursday	Williams ...	1st Wednesday
Katanning ...	3rd Wednesday	Wiluna ...	2nd Thursday
Kojonup ...	Last Wednesday	Wyndham ...	Do.
Laverton ...	3rd Tuesday	Yalgoo ...	Do.
Lawlers ...	1st Thursday	York	Do.
Leonora ...	2nd Tuesday		

The jurisdiction of Local Courts does not extend beyond £100.

A vacation is observed in every Local Court from the 20th December to 18th January, both days inclusive, during which period the Court shall not sit.

In the event of any sitting of the Local Court falling upon a Bank Holiday the Court shall sit on the day next following.

Digitized by Google

7.—MILITARY DEFENCES.

By the provisions of the Commonwealth Constitution, the Military and Naval Defences were brought under the control of the Federal Government in 1901. Each State continues to have its own Military Defence Force, but the chief command is held at the Federal headquarters.

The Defence Force of the State consists of a Permanent Artillery Force, enrolled March, 1893, and a Volunteer Force, first enrolled in 1861 under Local Ordinance 25 Vict., No. 3.

An annual allowance of 40s. is granted for every efficient volunteer up to 2091, in addition to which each corps receives an allowance for the maintenance of a band.

Each man has an annual allowance of 200 rounds of ammunition to be used at rifle practice. Target practice is further encouraged by prizes granted by the Government. Twelve parades per annum and the expenditure of 40 rounds of ball cartridges at target practice entitle an efficient to capitation grant; inspection and field days are included in this number, but not recruit drills.

King George Sound is fortified.

The Defence Force is commanded by a Commandant, who is assisted by a Staff Officer.

The headquarters of the Western Australian Defence Force are in Perth. There are now Volunteer Corps in all the principal towns of the State, and Cadet Corps in the larger towns. During 1899, 1900, and 1901, six Mounted Infantry Corps were sent to South Africa, comprising in all 922 men. All these, before leaving, went through a course of training at the military camp at Karrakatta.*

The Volunteer Corps of Garrison Artillery at Albany was, on the 30th June, 1901, 67 strong, all ranks.

Infantry.

This branch of the service has been organised into a brigade of five battalions, as follows :—

1st Battalion, stationed at			Perth, four companies ...	240
2nd	do.	do.	Fremantle, four companies ...	240
3rd	do.	do.	Bunbury, one company ...	240
			Geraldton, one company ...	
			Guildford, one company ...	
			York, one company	
4th	do.	do.	Perth, four companies ...	240
5th	do.	do.	Boulder, one company ...	360
			Broad Arrow, one company	
			Coolgardie, one company ...	
			Kanowna, one company ...	
			Kalgoorlie, one company ...	
			Menzies, one company ...	

* In addition, three *detachments of mounted* infantry were sent during the war, one *for each of the* Commonwealth Contingents.

Digitized by Google

Strength.

The total strength of the Volunteer Force on the 30th June, 1901, was 2,405 all ranks, as against 1,801 on the corresponding date of the previous year, being a nett increase of 604.*

Volunteer Reserve Force.

Before enrolment, every person shall have served Her Majesty's army, navy, or auxiliary force, or in the military force of a colony.

Every member shall perform six drills a year. An annual allowance of 10s. will be granted to each man for the purpose of providing him with a uniform, but no uniform will be supplied until he has completed two years' service, unless he deposits 20s. with his commanding officer, which sum shall be refunded him on his completing two years' service.

The clothing supplied will be required to last five years, unless the member shall be at any time embodied, when he will come under the clothing regulations for the time being. No person over the age of 60 years is to be enrolled or remain on the muster roll of the Volunteer Reserve Force.

Expenditure.

The cost of maintenance during the financial year 1900-1901 was £61,071 5s. 5d., which was accounted for as follows:—

	£	s.	d.
Maintenance Local Forces	18,050	4	3
Syndey Contingent in connection with inauguration of Commonwealth of Australia	2,384	18	5
Melbourne Contingent in connection with opening of Federal Parliament by H.R.H. the Duke of Cornwall and York	5,701	14	6
Contribution towards maintenance:—			
1. Albany Garrison	1,484	6	11
2. Thursday Island Garrison ...	553	10	8
3. Upkeep Australian Squadron ...	4,816	0	0
Inspector of Warlike Stores, Proportion of Salary	4	6	1
Military Units sent to South Africa ...	28,076	4	7
Total	61,071	5	5

* In June, 1902, the military forces of the State consisted of 1,891 of all ranks.

Digitized by Google

Table showing the Increase and Decrease in the Western Australian Defence Forces during the Year ended 30th June, 1901.

Corps.	Strength, 1899-1900.					Strength, 1900-1901.					Increase and Decrease since 30th June, 1900.		Remarks. Showing members who were serving in South Africa, but who are not included in totals.
	Establishment.	Effectives.	Non-Effectives.	Recruits.	Total on 30th June, 1900.	Establishment.	Effectives.	Non-Effectives.	Recruits.	Total on 30th June, 1901.	Increase.	Decrease.	
Permanent Force—													
Head Quarters Staff	2	2	...	...	2	2	2	...	...	2	...	...	
Permanent Staff	9	7	...	...	7	10	10	...	...	10	3	...	
Garrison Artillery	40	31	...	...	31	40	27	..	...	27	...	4	
Engineers	2	1	...	...	1	2	1	...	...	1	...	...	
Medical Staff	2	1	..	...	1	2	2	...	...	2	1	...	
Total	55	42	...	...	42	56	42	...	...	42	4	4	
Volunteers—													
Head Quarters Band	31	31	...	...	31	31	31	...	...	31	...	...	1 in South Africa.
Field Artillery Staff	2	2	...	...	2	...	...	...	...	...	...	...	
„ No. 1 Battery (Perth) ...	100	63	...	11	74	92	75	7	10	92	16	...	11 in South Africa.
„ No. 2 Battery (Fremantle) ...	100	76	8	8	92	90	77	4	15	96	4	...	3 in South Africa.
Garrison Artillery (Albany) ...	50	71	...	3	74	80	58	...	9	67	...	7	3 in South Africa.
Mounted Infantry—													
A Company (South-Western District)	120	60	...	60	120	120	143	...	11	154	34	...	7 in South Africa.
B „ (Victoria District) ...	...	...	...	...	...	120	40	...	52	92	92	...	2 in South Africa.
C „ (Eastern District) ...	60	...	...	60	60	120	48	...	60	108	48	...	2 in South Africa.
D „ (Central District) ...	...	...	...	...	...	120	62	12	19	93	93	...	1 in South Africa.

Digitized by Google

Table showing the Increase and Decrease in the Western Australian Defence Forces—continued.

Corps.	Strength, 1899-1900.					Strength, 1900-1901.					Increase and Decrease since 30th June, 1900.		Remarks. Showing members who were serving in South Africa, but who are not included in totals.
	Establishment.	Effectives.	Non-Effectives.	Recruits.	Total on 30th June, 1900.	Establishment.	Effectives.	Non-Effectives.	Recruits.	Total on 30th June, 1901.	Increase.	Decrease.	
Infantry Brigade—													
1st Battalion	180	150	5	46	201	240	223	5	42	270	69	...	11 in South Africa.
2nd "	180	185	13	47	245	240	222	15	22	259	14	...	6 in South Africa.
3rd "	360	247	74	35	356	240	262	48	53	363	7	...	23 in South Africa.
4th "	240	...	...	240	240	240	310	...	26	336	96	...	4 in South Africa.
5th "	300	...	...	300	300	360	221	...	181	402	102	...	23 in South Africa.
Army Medical Corps	9	6	...	...	6	20	18	...	...	18	12	...	2 in South Africa.
Veterinary Department	...	...	...	...	...	1	1	...	...	1	1	...	
Chaplains	...	...	...	...	...	23	23	...	...	23	23	...	
Total	1732	891	100	810	1801	2137	1814	91	500	2405	611	7	99 in South Africa.
Cadets—													
Senior	100	120	...	...	120	200	180	...	...	180	60	...	
Junior	200	246	...	...	246	200	240	...	...	240	...	6	
Total	300	366	...	...	366	400	420	...	...	420	60	6	
Mounted Infantry in South Africa...	...	...	...	...	472	...	...	...	...	551	79	...	

Permanent Force	**42**	**all ranks.**
Mounted Infantry in South Africa	**551**	**do.**
Volunteer Force	**2405**	**do.**
Total	**2998**	**do.**
Nett increase	**663**	**do.**

Digitized by Google

PART IV.—PUBLIC WORKS AND INSTITUTIONS.

1.—HARBOUR WORKS.

(From particulars mainly supplied by the late C. Y. O'Connor, M.I.C.E., C.M.G., Engineer-in-Chief.)

FREMANTLE HARBOUR WORKS.

The Fremantle Harbour Works, one of the most important works ever undertaken in Western Australia, were commenced in 1892, Lady Robinson, the wife of Sir W. C. F. Robinson, G.C.M.G., then Governor of the Colony, tipping the first truck of stone into the North Mole in the presence of a large and representative gathering, on the 16th November in that year.

The scheme of works, which has since been in active progress, was designed by, and until recently carried out under the direction of the Engineer-in-Chief for the State, the late Mr. C. Y. O'Connor, M. Inst. C.E., C.M.G. It aims at forming a safe and commodious harbour within the mouth of the Swan River, which will admit vessels of any burthen at all states of the tide, and transfer the work of the Port from the roadstead and its jetties to quays on the river banks.

The principal features of the scheme are as follow:—

The throwing out of two Ocean Moles from the North and South heads, respectively, of the River Estuary, to protect the entrance.

The blasting and dredging of a Channel 450ft. wide, and having a depth of 30ft. at low water, through the Rock Bar which crosses the whole width of the Estuary, and which, when the works were commenced, was mostly awash at low water.

The dredging out, to a depth of 30ft. at low water, of an inner basin, about three quarters of a mile in length, and 1,400ft. in width, between Quays constructed along both sides.

The Quay on the North side to have three Jetties running obliquely from its face, a distance of 400ft. into the Inner Basin, and 3,178ft. of wharfage along face of Basin.

There is also a wharf along North Mole 1,000ft., and along South Mole 300ft. The length of wharfage provided for is about 12,100ft., of which 6,478ft. is on North side. and *5,625ft. on South side.*

Digitized by Google

The reclamation of about 54 acres of Quay and Warehouse space on the South side of the river, and of about 20 acres on the North side, making about 74 acres in all.

The levelling down of Arthur's Head, over most of its extent, to form additional space for Railway Sidings and Goods Sheds, etc.

It is also proposed to construct a Graving Dock and Slip.

The Moles.

The Moles have been built on the "Pierres Perdues" system, the stone used, which is limestone and sandstone, with the exception of a comparatively small quantity of similar stone from Arthur's Head, being brought from the quarries at Rocky Bay, about 2½ miles up the Swan River from its mouth. The quarries are connected by railway lines to both Moles. The line to the South Mole crosses the river by a bridge built alongside the previously existing railway bridge, which, while in the first instance it served for passage of the stone trains, was designed to ultimately form part of the intended duplication of the main line from Fremantle to Perth, to which use it is now applied, the Mole having been completed.

North Mole.—This Mole was commenced in November, 1892. It was originally intended that it should extend out from Rous Head for 2,934ft.; but in January, 1895, when that length had been attained, it was decided to further extend it to a total length of 3,450ft., terminating there in a rounded head, faced with selected stone, which length was attained in November, 1895. Here the top of the Mole stands about 12ft. above the highest recorded or observed tide, the height above same at shore end being 10ft. The depth of water alongside, at the ocean end, is 28ft. at low water.

The width of the Mole on top, at the shore end, is about 30ft., and at the ocean end, exclusive of the rounded head, about 52ft.

The slope on the North, or exposed side, throughout is protected with the largest and heaviest stone obtainable from the quarries, varying from about 12 to 20 tons in weight, having a batter at present of about 2 to 1; the slope on the South side having a batter of about 1½ to 1.

Since November, 1895, a parapet, in the shape of a rubble mound, has been put along the North side of this Mole, increasing in height and width from the shore end to the ocean end.

As regards the North Mole and its present top widths and batters, the original design was for a uniform top width of 30ft., and this will probably result in due course by the gradual flattening out of the North slope (through the wave action induced by the winter seas from North to North-West), proportionately as the depth of water increases, so that ultimately the Mole will probably assume the uniform top width of 30ft., the slope at the ocean end *flattening* out to an average of about 3 to 1, and at shore end *remaining at about 2 to 1* as at present.

Digitized by Google

About 575,277 cubic yards of rubble stone, measured *in situ*, were deposited up to the 31st December, 1898, at an average total cost per cubic yard of 3s. 6½d., the original estimate being 4s. per cubic yard.

A further extension of 1,350ft. having been authorised, a commencement was made in July, 1899, to tip the stone beyond the 3,450ft. length. Up to 28th December, 1901, 374,515 tons were tipped, for a total cost (including preliminary expenses in re-opening and extending quarry) of £90,955, or an average cost of 58·29 pence per ton.

In July, it being found necessary to utilise a heavier class of stone for protecting the Mole from the winter gales, a supply of this material, sufficient for immediate requirements, was obtained from the Collie quarry. The total quantity of Collie stone tipped at the Mole was 2,880 tons, for a cost of £1,736, an average price of 144·67 pence per ton.

In September a start was made to tip the stone from the new quarry at Darlington. Up to the 28th December, 1901, 11,348 tons were tipped, for a total cost of £4,051, or an average price of 85·67 pence per ton.

A breakwind, in the form of an embankment, composed of 20,202 cubic yards of quarry refuse, faced with stone on both sides, has been constructed along the low-lying headland at the base of the North Mole, known as Rous Head, for a length of 2,200ft. to a height of 30ft. above low water mark. On the top of this has been erected an open picket fence, 15ft. in height, as a further protection to the inner harbour from the North-Westerly gales.

As the North Beach, which is a narrow neck of sand dunes resting upon a rock shelf at about low water level, and connecting with the mainland Rous Head, also all composed of rock, showed signs of weakness, it has been protected from the sea by an enbankment faced with rubble stone.

South Mole.—This was commenced in August, 1894, and extends out from Arthur's Head for 2,040ft., terminating in about 24ft. of water at low tide. It was at first slowly pushed out with the material obtained from the levelling down of Arthur's Head. In November, 1895, however, on the completion of the North Mole, the stone trains from the Rocky Bay Quarries commenced running to this Mole, which then advanced much more rapidly, and reached its ultimate length of 2,040ft. on 19th August, 1897. The width on top is about 25ft. for the first 1,100ft. of its length, and from thence it increases gradually to a width of 40ft. at the commencement of the rounded head. The slopes on both sides are about 1½ to 1. The islands to the South and South-West form a natural breakwater against storms from those quarters, and the North Mole protects it from the North and North-West gales, so that less resisting power is required than

the case of the North Mole, and although it has been subjected to very severe gales, no settlement has taken place, nor has any expenditure been necessary for maintenance.

Removal of the Bar.

The Bar originally was a long rolling ridge of rock, principally coralline limestone and sandstone, which, across the mouth of the river, showed a broad crest rising to low water level.

Blasting.—Blasting operations were commenced in July, 1894, and have been carried on successfully from temporary removable stages, the holes being drilled by hand labour. Up to 28th December, 1901, a total of 1,483,631 cubic yards of rock had been blasted, at an average cost of 32·64 pence per cubic yard. The cost of blasting was considerably increased owing to the proximity of the town of Fremantle preventing large charges being used or a number of charges being fired simultaneously.

It has on occasions been found necessary to use torpedoes to shatter several isolated patches of rock, more particularly in the entrance channel. It was impossible to estimate the number of cubic yards so dealt with, but the total amount charged to "Blasting Bar Account" was £674, which is included in the cost of blasting, as given in the preceding paragraph.

Dredging.—Dredging the blasted rock was commenced in December, 1894, with the bucket-dredge "Fremantle," specially designed for these works by Messrs. Coode, Son, and Matthews. This dredge has been found to be a most thoroughly satisfactory machine. Up to the 28th December, 1901, she had lifted and carried to sea a total of 1,112,696 cubic yards of rock (measured *in situ*), at an average cost, allowing for depreciation and interest, of 16·52 pence per cubic yard; also 508,064 cubic yards of sand, at an average cost, allowing for depreciation and interest, of 11·44 pence per cubic yard.

The bucket-ladder dredge "Parmelia," similar in design to the "Fremantle," but somewhat more powerful, commenced work in December, 1896, since which date she has been engaged in two methods of working, viz., dredging into her own hoppers, and into hopper barges moored alongside; she has lifted into her own hoppers and carried out to sea 563,244 cubic yards of rock (measured *in situ*), at an average cost, allowing for depreciation and interest, of 16·35 pence per cubic yard, and into hopper barges 132,506 cubic yards of rock (measured *in situ*), which have been towed by tug and discharged at sea, at an average cost, allowing for depreciation and interest, of 19·57 pence per cubic yard, giving a total of 695,750 cubic yards of rock (measured *in situ*), at an average cost, allowing for depreciation and interest, of 16·96 pence per cubic yard. She has also lifted into her own hoppers 760,710 cubic yards of sand, at an average cost of 7·83 pence per cubic yard, and into hopper barges 297,869 cubic yards of sand, at an average

Digitized by Google

cost of 14·92 pence per cubic yard, giving a total of 1,058,579 cubic yards of sand, at an average cost, allowing for depreciation and interest, of 9·82 pence per cubic yard.

The "Priestman" grab-dredge has been engaged in removing rock and sand in positions inaccessible to the other dredges. Since August, 1894, to September, 1900, when the dredge was transferred to Bunbury for similar work there, she lifted 17,482 cubic yards of rock, at an average cost, allowing for depreciation and interest, of 51·98 pence per cubic yard, and 114,754 cubic yards of sand, at an average cost, allowing for depreciation and interest, of 17·89 pence per cubic yard, or a total expenditure of £12,344 19s. 3d.

The works inside the Bar have now assumed definite shape, the sand-pump dredge "Premier" having been engaged in excavating the Swinging Basin, and reclaiming the foreshore on the South side. The total amount of sand removed and deposited at sea by this dredge has been 3,395,852 cubic yards, at an average cost, allowing for depreciation and interest, of 5·22 pence per cubic yard; 2,817,269 cubic yards of this was carried to sea in her own hoppers, at an average cost of 5·01 pence per cubic yard, and 578,583 cubic yards was discharged into hopper barges, towed to sea and discharged for 6·28 pence per cubic yard. In addition to this, 243,119 cubic yards, at an average cost of 16·00 pence per cubic yard, were pumped to the back of the Victoria Quay to reclaim the foreshore.

The sand-pump dredge "Governor," similar in design to the "Premier," but somewhat larger and more powerful, having two sets of pumps and twin propellers, started work in the Swinging Basin in November, 1899; the total amount removed and carried to sea to March, 1901, when she was transferred to Albany, was 1,534,847 cubic yards, at an average cost, allowing for depreciation and interest, of 5·20 pence per cubic yard; 338,180 cubic yards were pumped into her own hoppers and carried to sea, at an average cost of 3·92 pence per cubic yard, and 1,196,667 cubic yards into hopper barges towed to sea and discharged at an average cost of 5·57 pence per cubic yard.

The suction-pump dredge "Canning," in August, 1898, was transferred to this branch, and until September, 1899, when she was transferred back to Perth, she was engaged in excavating sand, etc., from under the Victoria Quay, the wharf having been constructed in advance of the dredging. The excavated material was discharged into wooden hopper barges and towed to sea to be deposited. During this period she removed 60,725 cubic yards for an expenditure of £3,418 8s. 1d., equivalent to an average cost of 13·51 pence per cubic yard.

After the transfer of the "Canning" to Perth it was found necessary to construct a small suction-dredge, somewhat similar in design, to complete the work under the Quay. This dredge was named the "Perth," and she has lifted and discharged into hopper barges 3,108 cubic yards *for an expenditure of £330 17s. 8d., an average cost of 25·55 pence per cubic yard.*

Digitized by Google

The total rock excavated by the dredges "Fremantle" and "Parmelia," and the "Priestman" grab-dredge, amounts to 1,848,376 cubic yards, at an average cost, allowing for depreciation and interest, of 17·00 pence per cubic yard.

The total sand excavated by the dredges "Fremantle," "Parmelia," "Premier," "Governor," "Canning," "Perth," and "Priestman" grab-dredge amounts to 6,919,048 cubic yards, at an average cost, allowing for depreciation and interest, of 7·05 pence per cubic yard.

Summarising the result of the dredging operations detailed above, there is now an entrance channel 30ft. deep and 450ft. wide, from the five fathoms contour for a distance of 3,000ft.; at its inner end, this channel is gradually widened out for a length of 1,550ft., to a point opposite the Western end of the Victoria Quay, where the width is increased to 575ft. The full width of 1,400ft. is attained at a further distance of 2,400ft. Hence for a further distance of 1,400ft., the full width of 1,400ft. and a depth of 30ft. are maintained, forming, with a further length of 800ft. of depth varying from 30 to 20ft., the present Swinging Basin.

The area of deep water inside the Harbour at present is 96½ acres, 30ft. deep; 3⅝ acres, 25ft. deep; 3 acres, 20ft. deep; and 7½ acres, 12ft. deep, giving a total dredged area of 110⅝ acres; 54 acres on the South foreshore have been reclaimed, and a wharf, the Victoria Quay, constructed along the South side of the harbour to a total length of 5,055ft. The wharf is 62ft. wide, and being in direct communication with the railway system of the State, there is every convenience for the transhipment of goods from oversea vessels. There are further facilities for the storage of goods on this Quay, in the shape of three goods sheds 240ft. by 100ft., two of which have been completed, and one is in course of construction. There is a uniform depth of 30ft. of water at low water mark alongside the whole of this wharf.

Mail Boat Jetty.—This is the Easternmost one of the three proposed jetties to run obliquely from the face of the North Quay, and was completed in July, 1900. It has a depth of 30ft. of water all round it, and affords safe berthage accommodation to vessels of any size. It is 400ft. long on the Western side, and 500ft. on the Eastern side.

North Quay.—This wharf, which is to be erected along the North side of the river parallel to and at a distance of 1,400ft. from the face of the Victoria Quay, is now in course of construction. The present berthage is 500ft., with a depth of 30ft. at low water mark. A further length of 145ft. is in various stages of completion.

Summarising, there are now available for berthage of vessels at *Victoria Quay, 5,055ft.*; Mail Boat Jetty, 900ft.; North Mole *wharf, 1,000ft.; South* Mole wharf, 300ft.; and North Quay *500ft.; making a* total of 7,755ft.

Digitized by Google

Temporary Slip, Rous Head.—This slip was completed in December, 1899, since which date it has been of great service to both Government and private owners of vessels. Vessels up to 850 tons burden having been taken up on it.

The total tonnage of vessels that had made use of the wharves in the harbour up to 28th December, 1901, was 4,268,691 tons.

Levelling Down Arthur's Head.—This work (so far as at present intended to be carried out) has been completed, and the levelled ground thus obtained forms one of the busiest parts of the railway station yard at Fremantle.

General Progress.

Instead of the low sandy shore, known to the old residents as Willis Point, there are now, at the river's mouth, substantial quays and jetties, with sailing vessels and steamships berthed alongside, receiving and discharging cargo for and from all parts of the world.

It was on 4th May, 1897, that the first practical demonstration of the satisfactory progress of the works was given, when the s.s. "Sultan," of the Western Australian Steam Navigation Co., 1,270 tons register (2,062 tons gross), from Singapore, entered the harbour and berthed at the Victoria Quay.

The crowning proof of the success of the harbour is now being amply demonstrated, when we see the English, German, and French mailboats making this their first and last port of call in Australia, entering with impunity in all weathers and at all hours. These vessels vary in size from 6,000 to 12,000 tons.

The works are progressing rapidly towards completion, the various portions of the scheme being pushed forward simultaneously. About 450 men are employed altogether, either at the quays, or on dredging and miscellaneous works.

The works are under the general supervision of the Engineer-in-Chief, assisted by a Resident Engineer.

Digitized by Google

Jetty and Wharf Accommodation at Fremantle on 28th December, 1901.

Locality.	Character of Situation.	Nature of Jetty or Wharf.	Accommodation.	Remarks.
mantle Ocean Jetty	Protected by islands and shoals in all directions, except N.W.	Timber jetty with straight head. Length, 3,294 feet	Mooring buoys—5 on South side, 2 on North; Railways—3 lines; 4 cranes—1, 35 cwt., 1, 2 tons, 2, 3 tons; ample goods shed accommodation on shore, directly connected by railway and road	At the extremity of jetty there is 19 feet of water at low tide, and 23 feet 9 inches at high water.
th Jetty ...	At shore end of Main Jetty, and well protected by same	Timber jetty with enlarged head. Length, 484 feet	2 lines rails; 5 derrick cranes—2, 30 cwt., 2, 25 cwt., 1, 20 cwt.; ample goods shed accommodation on shore in direct communication by road and rail	10 feet 9 inches water at high tide, 6 feet at low tide.
aner Harbour. rth Breakwater Wharf	Protected on the S.W. and W. by islands and shoals, and on N. and N.W. by mole	Timber wharf. Length, 1,000 feet	2 lines of rails in connection with goods sheds on shore	Depth of water from 22 feet 6 inches 26 feet 6 inches at low water.
th Breakwater Wharf	Protected from W. by islands and shoals; in all other directions by moles	Timber wharf. Length, 300 feet	1 line of railway connecting with goods sheds on shore; 1 mooring buoy	Depth of water from 16 feet 6 inches 20 feet at low water.
Quay ...	Situated along South bank of Swan River, inner basin of Fremantle Harbour	Timber Wharf. Length, 5,055 feet	Connected by railway and road to existing goods sheds. On the wharf three goods sheds have been erected; also Railway Station for convenience of oversea passengers	Depth of water 30 feet at low tide, and 34 feet 9 inches at high tide; water deepens near the outer or sea end of quay.
y ...	Situated along North bank of Swan River inner basin of Fremantle Harbour	Timber Wharf. Length 500 feet	Not connected by rail or road at present. Further wharfage now in full course of construction	Depth of water 30 feet at low water, and 34 feet 9 inches at high water.
at Jetty ...	Situated on North bank of Swan River, inner basin of Fremantle Harbour, running obliquely from face of North Quay	Timber Jetty, straight head. Length 450 feet	Connected by rail with existing goods sheds	Depth of water 30 feet at low water, and 34 feet 9 inches at high water.

Digitized by Google

BUNBURY HARBOUR WORKS.

When Harbour Works at Bunbury were first proposed, the late Engineer-in-Chief, Mr. C. Y. O'Connor, M.Inst. C.E., C.M.G., prepared alternative designs for them as follows:—1. For an inner harbour, similar in conception to that being constructed at Fremantle, with two ocean moles, and an entrance to Leschenault Estuary at the embouchure of the Preston River, estimated cost £430,000. 2. For a mole reaching out from Casuarina Point for a length of 3,000ft. to shelter, to some extent, the existing anchorage; estimated cost £100,000. The latter alternative was adopted.

The work was commenced on the 27th of April, 1897, when the first load of stone was tipped into the sea at the root of the breakwater, the ceremony being performed by the then Premier, Sir John Forrest, K.C.M.G.

The scheme, so far, is comprised in the construction of a mole running out into the ocean from Casuarina Point in a North-North-Easterly direction, thus partly enclosing Koombana Bay, and, to some extent, protecting the shipping from the force of the West to North-West gales.

The Mole is of the "Pierres Perdues" type, and follows generally along a curve of about half-a-mile radius. Its foundation for the whole distance is bare rock, the mole reaching, in 21ft. of water, a length of 3,200ft.

The top of the breakwater rises from 12ft. above low water at the shore end, to 16ft. at a distance of 1,500ft. seawards, and then continues level. Rise of tide 4ft. The width on top, as constructed, is 25ft. at the shore end, and thence increases to 56ft. at the ocean end. A parapet is now being constructed on the West side of the breakwater from the ocean end to the shore end. It is formed of rough rubble work with stone ranging up to 20 tons in weight, and decreases in height and width as it extends shorewards.

The inner slope will probably be 1½ horizontal to 1 vertical, and the outer slope 1½ to 1 from top of mole to near high-water; thence, downwards, the slope will be such as the action of the waves may produce, probably, on the average, about 3 to 1.

The stone is granite, having an average specific gravity of 2·73, which is equivalent to 13·13 cubic feet to the ton. In the form of a mass of rubble, as it stands in the mole, it is found to weigh 1·26 tons per cubic yard of mole. The stone is brought from a distance of 15½ miles, the quarry being 2½ miles North-East of the Collie station on the South-Western Railway. The tramway from the main line to the quarry is on an up grade of 1 in 25 for the whole 2½ miles.

The stones composing the breakwater vary from 1cwt. to 20 tons, the majority weighing from three to six tons.

Digitized by Google

On the 31st December, 1898, namely at the end of 20 months from the commencement of the work, the length of breakwater constructed was 3,200ft., at which length it will remain for the present, representing a total weight of stone deposited of 298,281 tons; and the parapet was carried back a distance of 220ft. from the end. The rate of progress per day averaged 6ft. 6in., the work having been much interrupted by heavy gales during the winter months. The cost, to same date, £67,401, which is exclusive of any charge for the tramway, first cost of plant, or opening of the quarry, was equivalent to 4s. 7d. per ton. This includes 1s. 1d. per ton freight paid to the Railway Department for carriage of stone between Collie and Bunbury.

The work during the year ended 30th June, 1899, consisted in widening the Mole to the full width, as originally designed, so that it at present varies from a width of 25ft. at the shore end, to an actually measured width of 57ft. at the sea end. The Breakwater was at first run out at a narrow width so as to attain shelter as quickly as possible, and it was breached and flattened down for a considerable distance by storms of great severity during the months of June and July, 1898; but it was soon restored again to its original height. A slight alteration of the centre line enabled all the stone disturbed by the sea to be utilised. As an additional protection, a parapet of loose rock has been constructed from the sea end back to 1,520ft. from the shore end.

The total expenditure on the Bunbury Harbour Works Scheme has been as follows:—

From Revenue	£68,562
From Loan	48,143
Total	£116,705

The jetty is constructed of timber, and consists of a neck or viaduct 2,010ft. long, running from the shore in a North-Easterly direction to a head 1,140ft. long, running North and South. The head affords berthage for two steamers and two sailers on the East, and one steamer and three sailers on the West side, the depth of water at low tide ranging from 14 to 20 feet. A viaduct 2,500ft. long, partly in stone and partly in timber, connects the lines on the jetty head with the main railway system of the State. With the exception of Northerly gales, the jetty is protected from all weather.

Digitized by Google

2.—JETTY AND WHARF ACCOMMODATION AT THE VARIOUS PORTS OF THE STATE, 31st DECEMBER, 1901.

Locality.	Character of Situation.	Nature of Jetty or Wharf.	Accommodation.	Remarks.
Wyndham ...	At head of Cambridge Gulf, not exposed to ocean seas	Timber jetty with T-head. Length, 230 feet	Goods shed, cattle yards and race; tramway, 2 feet gauge; 6 trucks and receiving shed	At low water vessels aground on mud; spring tides rise 23 feet. At jetty, depth at high water springs 29 feet 9 inches, at low water 5 feet, at high water neap tides, 20 feet.
Derby	At head of King Sound, not exposed to ocean seas	Timber jetty 516 feet long with T-head. 180 feet long	Goods and wool sheds, cattle yards and race; tramway 3 feet 6 inches gauge, with 10 trucks and one passenger car; water supply on jetty	Dry at low water; vessels aground on mud. Spring tides rise 36 feet. At jetty, depth at high water springs 29 feet; at high water neap tides 18 feet.
Broome	Protected by entrance point on S.W., thence by land on N. and E. and coast line trending S.S.W. Further partially protected by sand banks 3ft. above low water immediately outside anchorage, and by other banks dry at low water at a distance of 7 or 8 miles S. and S.S.W. of jetty	Timber jetty with straight head. Designed especially for shipping stock. Length, 2,500 feet	Tramway (2 feet gauge) cattle yards and race, Customs and goods sheds, 10 trucks and 1-ton crane; water supply on jetty	Dry at low water. Rise of spring tide, 30 feet. Vessels lie aground on muddy sand; 22 feet 6 inches water at ordinary spring tides; dry at low water.
Port Hedland ...	Land-locked harbour, perfectly protected from ocean seas	Timber jetty with T-head. Length, 480 feet	Customs shed; cattle yards and race; tramway, 2 feet gauge, 4 trucks	Rise of spring tide, 23 feet. Depth of water at high tide, 39 feet; low tide, 17 feet.
Balla Balla ...	In creek, sheltered from ocean seas ...	Timber jetty with T-head. Length, 157 feet	Loading platform and siding; tramway, 2 feet gauge, 4 wool trucks; sheep shipping facilities	Spring tides rise 14 feet; 16 feet of water at high tide, and 2 feet of water at low tide.
Cossack	On Butcher's Inlet or Cossack Creek	Quay constructed of concrete masonry	Goods shed, crane, tramway to Roebourne	Dry at low water; spring tides rise 13 feet.
Do.	Do.	Stock jetty	Stockyard and cattle-race ...	Lighters can lie afloat alongside at low water; 18 feet 6 inches of water at high tide; 4 feet at low tide.
Fortescue... ...	In creek, not exposed to seas	Landing stage; stone embankment; timber extension. Length, 100 feet	Goods shed and sheep-shipping facilities	Spring tides rise 14 feet. Depth of water at high tide, 21 feet; low water, 7 feet.
Cossiberton ...	Open to N.E. and North, slightly protected by Island to N.W. and W.	Timber lighter, jetty 1,120 feet long, with straight head	Sheep shipping facilities; 2 two-ton cranes on jetty; tramway, 2 feet gauge, 4½ miles to Onslow, 8 trucks; Customs and goods shed at terminus	Spring tides rise 6 feet 6 inches. At jetty, depth high water springs 14 feet 6 inches; at low water, 8 feet.

Digitized by Google

Jetty and Wharf Accommodation, etc.—continued.

Locality.	Character of Situation.	Nature of Jetty or Wharf.	Accommodation.	Remarks.
Southward of North-West Cape no true tides exist. Depths at highest and lowest water only can be given.				
Maud's Landing ...	Well protected by reefs on W. and S., but exposed to N.W. winds	Timber jetty with straight head. Length from shore line, 1,500 feet	Woolshed. Tramway (and 4 trucks), terminating with loading platform	Depth of water, 15 feet 6 inches at high tide; 9 feet 6 inches at low tide.
Carnarvon	Partially protected by islands, 25 miles distant, running parallel with coast on the W., but open to N.W.	Timber jetty with straight head. Length, 4,580 feet	Sheep and cattle yards, cattle-race, and tramway, 2 feet gauge, 2¾ miles to Carnarvon townsite, 13 trucks, crane, customs and goods sheds at terminus	High water, 22 feet; low water, 16½ feet.
Geraldton	Protected from S. and W., but open to N.W.	Timber jetty with straight head. Length from shore line, 1,756 feet	Railway and goods sheds. Mooring buoys, 2 hand cranes	High water, 21 feet; low water, 16 feet.
Dongara	Protected on W. by reefs dry at low water, but open to N.W.	Timber jetty with straight head. Length, 1,250 feet	Tramway, 3 feet 6 inches gauge, and goods shed; 2-ton crane on jetty, and 4 trucks	Average depth of water, 16 feet.
Rottnest	Sheltered by Rottnest Island	Stone jetty. Length, 66 feet	1-ton crane on jetty	5 feet water at high tide, at low water dry.
Owen's Anchorage	Sheltered by banks and islands	Timber jetty 770 feet long, with straight head 255 feet long	Cattle yards and tramway, 2 feet gauge	Depth of water, 16 to 20 feet.
Woodman's Point Quarantine Station Jetty	Sheltered by islands	Timber jetty, with L-head. 322 feet long	Tramway, 2 feet gauge, to Quarantine Station	Average depth of water, 6 feet.
Bunbury	Protected by mole	Timber jetty, with L-head. Length, 3,056 feet	Railways and goods sheds; cranes; mooring buoys; water supply on jetty	Berthage for steamers available on both sides. High water from 14 feet to 24 feet 8 inches; low water, from 10 to 20 feet.
Busselton	Partially protected from South-West by Cape Naturaliste	Timber jetty with straight head. Length, 4,027 feet	Railway on jetty, 3 feet 6 inches gauge	Total length, including 426 feet of embankment, 4,453 lineal feet.
Quindalup	Open to North; water very shallow for some distance outside	Timber jetty with straight head. Length, 633 feet	3-ton crane; tramway, 3 feet 6 inches gauge	High water, 7 feet 6 inches; low water, 4 feet 3 inches.
Albany—Town Jetty ...	Well sheltered in land-locked harbour ...	Timber jetty with straight head. Length, 2,016 feet	Goods sheds; railway, 3 feet 6 inches gauge; water supply on etty.	High water, 27 feet; low water, 23 feet.

Digitized by Google

Quarantine ...	Well sheltered in land-locked harbour ...	Timber jetty. Length, 450 feet	Waiting room; tramway, 2 feet gauge	Every accommodation for quarantine passengers, 11 feet 9 inches water at high tide and 6 feet 3 inches at low tide.
Railway ..	Well sheltered in land-locked harbour ...	Timber and iron, straight head. Length, 1,650 feet	Travelling cranes; four mooring buoys; railway, 3 feet 6 inches gauge	Depth of water: low tide, from 12 to 20 feet high tide, from 16 feet 6 inches to 34 feet 6 inches.
Harbour Master's and Defence	Well sheltered in land-locked harbour; just inside entrance Inner Harbour on North side	Timber jetty, L-head. Length, 337 feet	Tramway, 2 feet gauge ...	7 feet 6 inches water at high tide; 3 feet at low water.
Esperance	Protected by Dempster Head from South-West, and by islands from other directions except South	Timber jetty, straight head. Length, 2,810 feet	Tramway, 3 feet 6 inches gauge, large goods shed, mooring buoys	Depth of water, from 9 to 17 feet at low tide to 14 to 22 feet at high tide.
Israelite Bay ...	Partially protected by shoals and weed banks	Timber boat jetty. Length, 248 feet	Boat landing and steps	Approach embankment across marsh, 9 feet water at high tide; 4 feet at low water.
Eucla	Partially protected by banks	Timber jetty, straight head. Length, 496 feet	Tramway, 3 feet 6 inches gauge; derrick on head	1,000 lineal feet of approach road made. Depth of water, from 5 feet at low tide to 9 feet at high water.

* For Fremantle *see* "Fremantle Harbour Works."

Digitized by Google

[illegible] on the North by a [illegible] Island to the Winding [illegible] line from the West [illegible] Island, and thence to [illegible] end of "Warnbro" [illegible] the Sisters and Point [illegible] main land between [illegible]

[illegible] includes the waters [illegible] of Bald Head on the [illegible]

[illegible] Extends from Point [illegible] sea beach on the North [illegible] Moore to White Peak.

[illegible] water embracing that [illegible] ward of a line from Islet [illegible]

[illegible] of water embracing that [illegible] and Eastward of a line [illegible] the former lying N.E. [illegible]

[illegible] water embraced within an [illegible] on Hill, a North and South [illegible] and West line drawn three [illegible] and South line three miles [illegible] ding the whole extent of [illegible]

[illegible] 1-66. -Bounded on the South [illegible] Westward from the mouth of the [illegible] Dolphin Island, including all [illegible] lets, and navigable waters; on [illegible] from North end of Dolphin [illegible] Island, and thence to North end [illegible] South-Easterly to North end of the [illegible] and on the East by a straight [illegible] North from the sea mouth of [illegible]

[illegible] piece of water, whether sea or [illegible] a radius of seven miles from [illegible] Ashburton River.

[illegible] piece of water embracing that [illegible] within a radius of seven miles [illegible] the centre of Babbage Island.

Digitized by Google

DONGARA, 7-8-90.—All that piece of water embraced within a radius of three-quarters of a mile from the present Dongara Lighthouse.

BUNBURY, 21-4-55.—The Port of Bunbury extends from Point Casuarina to a part of the sea coast one league North of the mouth of the Leschenault Inlet.

VASSE, 4-9-78.—Bounded by lines starting from the Quindalup Jetty, and extending due North three miles; thence to a point three miles due North from Lockeville Jetty; thence to a point on the shore 20 chains North-Eastward from the entrance to Vasse Inlet.

FLINDERS BAY OR PORT AUGUSTA, 21-4-55.—Includes all the space lying to the West of a line from the Southernmost dry rock of the Alouarn Isles to a spot one league Eastward from the mouth of Hardey's Inlet.

ESPERANCE, 1-8-94.—All that piece of water within a radius of 10 miles from Western Entrance Point of Bandy Creek.

PERTH, 21-11-81.—All that piece of water, being part of the Swan River, and known as Perth Water, bounded on the North-East by Perth Causeway, on the Southward by the left bank of Swan River downwards to Point Belches; on the South-West by a North-Westerly line from Point Belches to the right bank of Swan River; and on the Westward and Northward by the said right bank of river upwards to the North-West end of the Causeway aforesaid.

PORT HEDLAND, 23-12-98.—All that piece of water within a radius of five miles of Hunt Point at the entrance of Port Hedland.

Digitized by Google

4.—DESCRIPTION OF LIGHTS ON WESTERN AUSTRALIAN COAST.

(Information supplied by the Chief Harbour Master.)

Name of Light.	Position.	Latitude S.		Longitude E.		Colour of Light.	Character of Light.	Period of Revolution or of System.	Miles seen in Clear Weather.	General Description of Building or Vessel.	Height in Feet above High Water.	Height in Feet of Building.	Year Established.	Character and Order of Apparatus, and Power in units of 1,000 Candle Power.	Remarks.
		°	′	°	′										
Wyndham Jetty Light	South end of Cambridge Gulf	15	27	128	06	Red	Fixed...	....	4	Wooden gallows on jetty end	15	12	1895	Ordinary Lantern.	
Derby Jetty Light	Head of King Sound	17	17	123	35	White	Fixed...	....	4	Platform on jetty end, wooden	26	20	1901	Dioptric, 6th Order	One Red Sector visible from North end of Mary Ann Island.
Broome Jetty Light	Roebuck Bay	17	58	122	14	Red	Fixed...	...	5	Wooden platform	...	..	1899	Ordinary Lantern	At extreme end of jetty.
Broome Leading Lights	Roebuck Bay	17	57	122	14	White	Fixed...	....	15	Steel skeleton frames	...	...	1900	Both 5th Order Dioptric	Lights in line N.N.E. ¼ E. lead between Channel Rock and West end of Middle Ground.
Jarman Island Light	Centre of Jarman Island, Port Walcot	20	39	117	13	White	Fixed...	...	15	Iron tower (painted, lower half red, upper half white)	97	30	1888	Dioptric, 3rd Order 2½	
Onslow Jetty Light	North Side of Entrance to Curlew River	21	40½	115	00	Red	Fixed	...	4	Wooden platform on jetty end	25	15	1901	Ordinary Lantern	Jetty for Lighters.
Babbage Island Light	West Side of Babbage Island Entrance, Gascoyne River	24	52	113	38	White	Fixed...	...	15	Wooden frame tower, square in form, painted white	102	60	1896	4th Order Dioptric	Two Red Sectors, one visible from Northward between S. 15° E. and S. 41° E., which leads West of Blowfish Bank, and one visible from Southward between N. 15° W. and N. 31° E., which leads West of Elbow Shoal.
Babbage Island Jetty Light	End of Babbage Island Jetty	24	52	113	37	Red	Fixed...	....	4	Wooden platform on jetty	25	15	1899	Ordinary Lantern	Stock and cargo jetty.
Lagoon Point, Shark Bay	Peron Peninsula	25	55	113	30	Red	Fixed...	....	4	Wooden gallows	30	12	1898	Ordinary Lantern	Pearling Station.

Digitized by Google

No. 1 Bluff Leading Light upper	North part of Champion Bay, about one mile Southward of Chapman River	28	45	114	37	White	Fixed...	.	8	Square white stone tower	65	25	1882	Dioptric Holophote, 1	Leading lights 300 yards apart visible N. 76° E. and S. 76° W. Lights in line E. by N. ¼ N. lead through the channel Northward of Moore Point reefs.
No. 2 Bluff Leading Light lower	North part of Champion Bay, near high water mark	28	45	114	37	White	Fixed...	...	8	Octagonal white stone tower	41	37	1882	Dioptric, 4th Order ½	
No. 1 Geraldton North Jetty Light	Near centre of town of Geraldton	28	46	114	36	Red	Fixed	...	5	Hoisted to a wrought iron tapered mast, lowered in day time	30	10	1895	Dioptric Port Light, 5th Order	Leading Lights in Line lead clear of Inner Knoll Buoy and up to North Jetty.
No. 2 Geraldton North Jetty, Shore End	Shore End of Jetty	...		...		Red	Fixed	...	5	Wooden mast	40	20	1901	Port Light, about 7th Order	
No. 1 Point Moore Upper Light	Extreme West End of Point Moore, South of Champion Bay	28	47	114	35	White	Revolving, showing single flash every 40 secs.	...	18	Round iron tower, painted red and white horizontal bands	110	114 Base to Van	1878	Revolving Dioptric Light, 2nd Order 20	Visible from seaward between the bearings of N. 25° W. and S. 31° W.
No. 2 Point Moore Lower Light	Same Tower as Upper Light	28	47	114	35	Red in 2 Sectors	Fixed	...	12	Round iron tower, painted red and white horizontal bands	90	...	1878	Dioptric, 4th Order, vertical prisms ½	Two red sectors are shown from Lower Light in same building, one visible from Southward between N. 25° W. and N. 2° W. which leads 1½ miles West of African Reef; another from Northward between S. 31° W. and S. 59° W., which leads one cable E. of Inner Knoll Rock.
Dongara Light Jetty	End of Dongara Jetty, Port Irwin	29	17	114	56	Red	Fixed	...	4	Wooden platform on jetty end	18	12	1887	Ordinary Lanterns.	
Port Dongara Light	150 yards from Beach	29	17	114	56	White	Fixed	...	5	Wooden gallows	61	12	1887	Ordinary Lantern $\frac{1}{32}$	

Digitized by Google

Description of Lights on Western Australian Coast—continued.

Name of Light.	Position.	Latitude S.	Longitude E.	Colour of Light.	Character of Light.	Period of Revolution or of System.	Miles seen in Clear Weather.	General Description of Building or Vessel.	Height in Feet above High Water.	Height in Feet of Building.	Year Established.	Character and Order of Apparatus, and Power in units of 1,000 Candle Power.	Remarks.
		° ′	° ′										
Rottnest Light	On a hill 154ft. high, near middle of Island	32 00	115 31	White	Revolving, showing single flash every 20 secs. Flash 3 secs., eclipse 17 secs.	1 complete revolution in 2min. 40secs.	23	Round stone tower of a natural grey colour	264	127 Base to Vane	1896	Revolving Dioptric, 1st Order 45	Visible all round the horizon.
Bathurst Point, Rottnest Island	On Bathurst Point, N.E. Extremity, Rottnest Island	31 59	115 33	White	Fixed	...	15	Round stone tower of a natural grey colour	98	...	1900	Dioptric, 2nd Order	Visible from seaward over an arc of 200 degrees, i.e., between the bearings of E. ¼ S. through North to N. W. by W. ¼ W.
Head	On Arthur Head South side of Swan River	32 03	115 45	White	Fixed ...	...	14	Round stone white tower	92	71	1879	Dioptric, 3rd Order 2	
tle Jetty	End of Fremantle Jetty	32 03	115 45	Red	Fixed ...	...	5	Iron skeleton frame	30	20	1893	Dioptric, 6th Order	Jetty lighted up with 20 ordinary gas lamps.
, Lights)	Entrance to River Harbour	32 03	115 45	Three Red Lights North side of Channel	...	...	3	Wooden pile beacons	14	10	1898	Dioptric, 5th Order.	
				Two White Lights South side of Channel	...	...	4						
th Mole Light	End of South Mole	32 03	115 45	Red occulting	...	...	7	Steel skeleton frame	36	24	1898	Dioptric, 5th Order	To be improved.
North Mole Light	End of North Mole	...	...	White	Fixed ...	...	5	Wooden skeleton frame tower painted white	36	24	1897	Ordinary Lantern	

Digitized by Google

Woodman's Point Light	Woodman's Leading	Woodman's Point	32	07	115	47	White, Red, and Green	Fixed occulting	...	17	Round stone tower of a natural grey colour	126	42	1902	Dioptric, 1st Order	Building, three coloured rays.
Bunbury	Light	On summit of Hill 400 yds. within Casuarina Point, Koombana Bay	33	19	115	39	White	Fixed	...	12	Square wooden tower, painted white	117	30	1870	2 Ordinary Oil Lamps with Reflectors $\frac{1}{11}$	To be improved.
Bunbury Lights	Jetty (two)	End of Jetty, Koombana Bay	33	19	115	39	Red	Fixed ...	...	4	Two wooden gallows 200 feet apart	25	15	1890	Ordinary Lantern	Two Red Lights in line lead North of Reef Buoy and clear of end of mole.
Vasse Light	...	Geographe Bay, 50 yards from inner end of Jetty	33	38	115	21	White	Fixed ...	...	11	Square wooden tower on piles, painted white	63	56	1870	Ordinary Oil Lamps $\frac{1}{11}$	
Vasse Jetty	Light	End of Busselton Jetty, Vasse	33	38	115	21	Red	Fixed ...	...	4	Wooden gallows ...	25	15	1870	Ordinary Lantern.	
Cape Leeuwin Light		Cape Leeuwin Point	34	22	115	09	White	Feu éclair or Lightning light revolving, showing a single flash every 5sec. Duration of flash one-fifth of a sec., eclipse four and four-fifths seconds	...	21	Round stone tower of a natural grey colour	185	115	1896	1st Order lens light, giving a single flash every 5 seconds, 145	Revolved on Mercury, one complete revolution of the apparatus in 10 seconds.
Breaksea Light	Island	1,200 yards from East extreme of Breaksea Island	35	04	118	04	White	Fixed...	...	25	Round granite tower, of a dark grey colour	390	34	1901	Dioptric, 1st Order	Visible from seaward between N.E. ¼ N. and W. by S. ¼ S., and is also visible over low neck inside Bald Head on a N.E. bearing. From within the Sound it is visible all round, except where obscured by Michaelmas Island.

Digitized by Google

Description of Lights on Western Australian Coast—continued.

Name of Light.	Position.	Latitude S.	Longitude E.	Colour of Light	Character of Light.	Period of Revolution or of System.	Miles seen in Clear Weather.	General Description of Building or Vessel.	Height in Feet above High Water.	Height in Feet of Building.	Year Established.	Character and Order of Apparatus, and Power in units of 1,000 Candle Power.	Remarks.
		° ′	° ′										
Channel Beacon Lights (four)	Entrance to Princess Royal Harbour	35 02	117 55	Two Red Lights North side of Channel, and two White Lights South side of Channel	Fixed...	...	3	Wood pile beacons	14	10	1892	Dioptric Port Lights, 6th Order	Guiding Lights to Inner Harbour.
					...	....	4	... ...	...	...	1892		
Point King Light	On extremity of Point King, North side of Princess Royal Harbour	35 02	117 55	White	Fixed...		12	Wooden tower, square	47	17	1858	Dioptric, 5th Order ½	
...any Deep-...r Jetty Light	...	...	...	Red	Fixed...	...	3	Wooden mast ...	...	...	...	Ordinary Lantern,	
...v. Town ...Leading ...ts (two)	...	...	...	Red	Fixed...	....	3	Wooden mast ...	...	...	....	Ordinary Lanterns	Lights in line lead up to Town Jetty.
...nce Jetty ...t	End of Esperance Bay Jetty	...	...	Red	Fixed...	....	4	Wooden platform...	28	15	1901	Ordinary Lantern	Town Jetty.

Digitized by Google

5.—WATER SUPPLY AND ARTESIAN BORES.

(Particulars mainly supplied by Public Works Department.)

WATER SUPPLY FOR THE GOLDFIELDS.

It is not only desirable, but absolutely necessary, in a dry zone such as is the interior of Western Australia, to provide a water supply adequate to the demands of a rapidly increasing population. Communication, transport, even life itself, depend so much on water that the greatest desideratum, in every district, is consequently a good water supply.

On the goldfields it is not only for drinking or sanitary purposes that water is required, but also for the production of gold. The number of dividend-paying mines is at present small. The average of gold obtainable per ton is as good as, if not better than, that in other Australasian States, but there is a lack of suitable water to produce satisfactory crushings. Water is found in many places, but most of it contains such an *excessive* quantity of salt and other impurities that it is unsuitable for battery purposes. That the importance of overcoming this difficulty has been promptly and thoroughly recognised, is shown by the Government of the State having undertaken the great task of pumping water from the coast to Coolgardie. The scheme was designed by the then Engineer-in-Chief (the late Mr. C. Y. O'Connor, C.M.G.) and approved of by several of the leading engineers in the English-speaking world.

COOLGARDIE WATER SCHEME.

For Supplying Water to the Principal Goldfields of Western Australia.

In the project known as "The Coolgardie Water Scheme" it is proposed to deliver to the goldfields of Coolgardie and surrounding districts a supply of five million gallons per diem of fresh water, to be pumped from a storage reservoir on the Helena River, about 23 miles from Perth, and 328 miles from Coolgardie. The works contemplated, and now in course of construction, consist of:—

(*a.*) Storage reservoir on the Helena River.

(*b.*) Pumping installations at eight stations.

(*c.*) Main conduit of steel pipes.

(*d.*) Receiving tanks, minor reservoirs, and service reservoirs.

(*e.*) *Distributing pipes on goldfields.*

Digitized by Google

STORAGE RESERVOIR.

As a result of gaugings of the river flow it has been decided to construct a regulating reservoir capable of storing two years' supply. This is to be attained by building a concrete weir to a height of 100 feet above the river bed; but the foundation is in one part from 90 to 100 feet below the river bed. This latter, however, applies to a length of 15 feet only of the wall, the top length of which will be about 760 feet. The width or thickness at a little below level of river bed will be 85 feet, and the walls of the excavations below that level are such, that this width of 85 feet will be also the maximum width of the concrete structure at its greatest depth, although at a level intermediate between the two the excavations to solid rock have, for a few feet only in length of the wall, entailed concrete filling to a width of about 120 feet. The width near crest is 15 feet, and the crest and lip of the weir are designed for a "curve of contact" to avert any leaping by the overflow during exceptional floods. The waste-weir is being formed on the main wall, and will provide for a free overflow five feet in depth and four hundred feet in length. The usual accessories of valve tower, scour pipes, outlet pipes, gangway, etc., are constructed or in course of construction. The depth of water at full supply level will be 100 feet. The lowest level from which water will be drawn by the pumps at Pumping Station No. 1 is 20 feet above river bed; and the capacity of reservoir between that level and overflow level will be 4,600 million gallons. With the reservoir full, the water will extend upstream to a distance of 7¼ miles from the weir.

PUMPING INSTALLATIONS.

The bed of the Helena River, at the weir site, is 320 feet above sea level, and the lowest supply level from which water will be pumped is 340 feet, while the main distributing reservoir will be 1,630 feet above sea level. The total net lift is, therefore, about 1,290 feet; adding to this the head due to frictional resistance in the pipe main (with a liberal margin for incrustation), allowance for maximum possible loss of head due to variation of water level at Pumping Stations, and other contingencies, the total gross lift is estimated to be about twice the net lift, and provision has been made for a gross lift of 2,700 feet.

Another matter of importance is that of dividing the total lift amongst several sets of engines and pumps variously located along the pipe line. The pipe main to Coolgardie being 328 miles in length, it was imperative that the thickness of the pipes be kept within economical limits, and in order to achieve this without undue division of the pumping installations, and having regard to the irregularity of the profile, it was considered that eight pumping stations would give the best results, and arrangements have been made accordingly.

The first pumping installation is located close to the main *storage reservoir*, and will consist, when finished, of three sets of

Digitized by Google

boilers, engines, and pumps—two sets to work and one to spare—and each set will be capable of pumping 2,800,000 imperial gallons per diem against a head, including friction, of 450 feet. The second pumping station is located on the pipe line at a distance of about one and a half miles from the first pumping station. The machinery at No. 2 will be precisely similar to that at No. 1, and will raise the water to a high point on the Darling Ranges (22 miles from pumping station No. 2), from which the water will gravitate (through pipes laid generally alongside the railway line) for a distance of about 54 miles to pumping station No. 3, the machinery of which will be precisely similar to that at No. 1 and No. 2. From station No. 3 the water will be pumped to station No. 4, which is 140 miles from the head works, and the machinery of which will be similar to that of stations Nos. 1 to 3. Stations 5 to 8 (inclusive) are located close to the railway, and at the following mileages on the pipe line:—No. 5, 172 miles; No. 6, 218 miles; No. 7, 250 miles; No. 8, 295 miles. At stations 5 to 8 (inclusive) the machinery will be similar throughout, but there will be only two sets of boilers, engines, and pumps (one to work and one to spare) at each station, and the total normal lift provided for at each is 225 feet, but with the further provision that, while each set of pumping engines will be capable of raising the full supply to a height of 225 feet, it will also be capable of pumping past one station or reservoir a reduced supply corresponding to the increased head.

MAIN CONDUIT.

The main conduit consists of steel pipes of the Mephan Ferguson patent locking-bar type. The internal diameter throughout is 30 inches, the minimum thickness a quarter of an inch, and the maximum thickness five-sixteenths of an inch. Generally, the pipes will be laid in trenches, and connected by double socketed sleeves or thimbles with lead joints.

RECEIVING TANKS, MINOR RESERVOIRS, ETC.

At the pumping stations 2 to 8 (inclusive) receiving tanks will be constructed (excepting cases where suitable reservoirs already exist) of sufficient capacity to provide for irregularities in the pumping and for other contingencies.

Service Reservoir.—A service reservoir of 1,000,000 gallons capacity is being constructed on Toorak Hill, Coolgardie, which is about 150 feet above the level of the chief parts of the town.

Works beyond Coolgardie.—Besides the above, the original scheme provides for the expenditure of £180,000 for works beyond Coolgardie, including distributing mains to various mining centres and a *service reservoir at Kalgoorlie.*

Digitized by Google

General.

Generally, the pipe main will be adjacent to the railway line throughout, and the pumping arrangements are such that a reduced quantity of water can be pumped from station No. 5 past station No. 6 to No. 7, also from No. 6 past No. 7 to No. 8, and from No. 7 past No. 8 to the main service reservoir. With the pumping machinery arranged as above, and the storage capacity provided for along the route and near the terminus, the contingency of cessation of pumping at any one station for a period of seven days is provided for. It is estimated that water will be supplied to domestic consumers at a price ranging from 6s. to 8s. per 1,000 gallons, according to the quantity consumed.

Progress of Work to 31st December, 1901.

RESERVOIRS.

Helena Weir.—About 65,976 cubic yards of rammed concrete have been laid in position in the weir wall, inner valve tower, aqueduct, retaining wall, and outer valve house, all of which are practically completed. The wall itself has reached its full height (R. L. 420 feet), and the piers and gangway are now being constructed. All the valves, outlet and inlet pipes, and scour pipe, have been placed in position. The whole of the reservoir basin, covering an area of about 1,000 acres, has been cleared.

Baker's Hill and West Northam Regulating Tanks.—The work of excavation for these tanks, which are each to be of 500,000 gallons' capacity, is in progress.

Bulla Bulling Main Service Reservoir.—The site for this reservoir, which is to have a capacity of 12,000,000 gallons, has been cleared, and satisfactory progress is being made with excavation.

Toorak Hill Minor Service Reservoir.—The excavation of this reservoir (of 1,000,000 gallons capacity) has been completed.

CONDUIT.

The whole of the pipes required for the main from the weir to Coolgardie (328 miles) are now built, and about 100 miles of these have been laid and jointed, and an additional 215 miles are distributed along the line ready for laying and jointing.* Nearly all the pipes for the branch from Coolgardie to Kalgoorlie (23½ miles) have also been manufactured, but have not yet been distributed. The whole of the trench to Coolgardie, with the exception of about 27 miles, has also been excavated.

PUMPING STATIONS.

Sidings and Coal Bins.—All the sidings from the main line to the several pumping stations are practically completed, and coal bins at stations Nos. 2, 3, and 4 are under construction.

Boiler Foundations.—At stations Nos. 1, 2, 3, and 4 these are completed. All the boilers are in position, and chimney stacks erected.

Engine Foundations.—At station No. 1 the foundations for one of the three pumps are practically completed, and those for the

* The water distribution has since practically reached Southern Cross.

Digitized by Google

other two are nearing completion. At station No. 2 foundations for the whole of the machinery are completed. At station No. 3 all the foundations are completed, with the exception of laying the bedstones. At station No. 4 foundations are completed, with the exception of building piers and placing bedstones. At stations Nos. 5 and 6 excavations for foundations, both for engines and boilers, are in hand.

Receiving Tanks.—At station No. 2 excavation is completed, and about half the concrete walls are built. At station No. 4 excavation for tank is completed, and all the broken stone and sand for concrete work is now on the site. At station No. 5 construction of tank is in hand.

Engine and Boiler Houses.—At stations Nos. 1 and 2 these are under construction. At stations Nos. 3 and 4, foundations are completed up to level of brick work.

Employees' Cottages.—Plans and drawings are ready for inviting tenders for quarters at stations Nos. 1 and 2. They are practically completed at stations Nos. 3 and 8.*

OTHER WORKS.

During the year 1896-7, prior to commencement of the works described above, works of a varied character were carried out by the General Water Supply Branch of the Public Works Department, with a view to temporarily overcoming the "water difficulty" on the goldfields. These works comprised:—General water supply; shallow and artesian boring; conservation and protection of water in reservoirs, tanks, soaks, lakes, lagoons, and claypans; construction of wells; erection of condensers; survey and construction of roads; making of stock routes; reporting on applications for grant of private water-rights under "The Goldfields Act, 1895," and reporting on applications for concessions for private water supply schemes.

Report on other Goldfields Water Supply Works for the three years ended 31st December, 1901:—

The operations of "General Water Supply" Branch were carried on in the—

(*a.*) Coolgardie Goldfields Water Supply District;

(*b.*) Murchison Goldfields Water Supply District;

(*c.*) Pilbara Goldfields Water Supply District; and on the

(*d.*) Northern Stock Routes.

The expenditure incurred through the Goldfields Water Supply Branch of the Public Works Department during the three years ended 31st December, 1901, amounted to about £132,000, and the gross revenue therefrom was £18,900.

As the total maintenance expenditure was £28,000, and the actual revenue £18,900, it will be seen that the disproportion between maintenance and revenue is in favour of maintenance expenditure; but it should not be overlooked that the large

* *All have been completed since.*

Digitized by Google

indirect revenue from the works of this branch was by far the more important factor.

It has been found possible to lease many of the watering stations advantageously, and the system is found to work well. The total number of leases executed for the three years is 105.

Shallow hand-boring operations to the extent of 15,000ft. were carried out during the period under review.

A number of water reserves had to be surveyed by qualified surveyors attached to the branch, for gazetting purposes; some of these reserves contained considerable areas, and caused a large amount of work in the field, as well as in the office.

Works on Northern Stock Routes were carried out during the three years, and an examination of a proposed Easterly deviation has been effected.

Altogether, about 70 new wells were constructed, and about 40 were improved and repaired along the various routes.

The number of tanks completed is 18, with a capacity of 87,871,900 gallons; the total estimated cost was £228,592. The tanks are located at the following points:—Parker's Range (4,963,000 gallons), Londonderry (3,098,200 gallons), Bulong (3,027,200 gallons), 42-Mile (3,121,700 gallons), Kanowna (3,691,800 gallons), Black Flag (3,244,400 gallons), Broad Arrow (10,060,800 gallons), Siberia (1,575,500 gallons), Speakman's (1,008,500 gallons), Mulline (1,502,700 gallons), Bardoc (2,045,400 gallons), Goongarrie (1,048,300 gallons), Kalgoorlie (1,634,000 gallons), Menzies (3,049,400 gallons), Niagara (38,750,000 gallons), Widgemooltha (3,026,000 gallons), 50-Mile Rock, Wingarnie (3,025,000 gallons), Norseman (3,000,000 gallons).

ARTESIAN BORES.

(By A. Gibb Maitland, C.E., F.G.S., Government Geologist.)

Artesian Wells, Records of Bores, Analyses of Artesian Water.

In its broader topographical features, Western Australia falls naturally into three divisions of different physical character:—

(*a.*) The Coastal Plain. This consists in reality of a fringe of strata around the coast, with a more or less gentle slope to the seaward It is formed for the most part of shallow water deposits, sandstones, conglomerates, and thin shales, with occasionally incoherent sand and clays. It has a width of 60 or 70 miles in places on the Western Coast, though in the country at the head of the Great Australian Bight, being absolutely devoid of rivers, it extends some 200 miles into the interior. Its inner margin reaches an altitude of 600 feet above sea-level in certain localities. The Coastal Plain is separated from the interior by a belt of

Digitized by Google

(*b.*) Hill Ranges, which form what may be called the escarpment of the Plateau and Plains of the interior. The Hill Ranges have an average elevation of about 1,200 feet, though isolated Ranges reach altitudes of 4,000 feet above sea-level. This escarpment has a short or steep slope down to the edge of the Coastal Plain, into which it gradually merges. This belt of country, drained by the rivers of the State, is formed of granitic and metamorphic rocks, the decay of which produces excellent soil; it comprises, owing to its rainfall, the principal Agricultural Districts of the State.

(*c.*) The Plateaus and Plains of the Interior consist of a broken tableland, from which rise isolated hills and ridges of metamorphic rocks, often separated by sand-plains of some considerable extent, and containing depressions occupied by saline marshes, clay flats, brine lakes or deposits of salt. There are no rivers, and the rainfall is slight. This plateau forms the chief mineral region of the State.

The Coastal Plain is of considerable economic importance, in that the certainty of obtaining artesian water from the underlying strata has now been thoroughly established. The system of boring for artesian water, however, is capable of great expansion in the State, and is limited only by locality, in respect to the area over which the artesian water strata extend.

A glance at any Geological Map of Western Australia shows an enormous extent of Recent and Tertiary Strata entering the State at its Eastern border, in the Nullabor Plains, and extending without any interruption as far as Israelite Bay. These strata consist of porous limestones associated with beds, into which the rainfall is rapidly absorbed and discharged seawards in the form of fresh water springs. Where these strata have been pierced on the South Australian side of the border, the section invariably shows from 300 feet to 500 feet of sandy water-bearing beds, of undetermined age, covered by a variable thickness of calcareous strata of both Older and Newer Tertiary age. The beds have a prevailing dip towards the Great Australian Bight, and water rises in the bore holes to a height equal to that of the sea level. So far, however, the water obtained has proved to be either salt or brackish, but at any rate suitable for stock purposes.

The whole of the area of these beds in the Southern portion of this State may be described as an artesian water area, though there may be, and undoubtedly are conditions affecting the water supply, such as local variations in the thickness, the relative porosity of the beds, and the unevenness of the floor upon which they were laid down, which, with our present meagre knowledge, can only be set at rest by the operations of the drill.

The strata of the Coastal Plain in the vicinity of the Swan River have proved that in certain areas they possess all the conditions necessary for yielding an overflowing supply of water.

Digitized by Google

structure of the Coastal Plain differs in some respects from the typical areas in which artesian water has been obtained in the Eastern portions of Australia. The strata are horizontal or nearly so, though there is a slight local dip of about five degrees in places. The effect of this horizontality is shown in the fact that the water-carrying beds do not crop out on the surface at the foot of the Darling Range, but impinge directly against that portion which is now concealed from view. These beds, clays (marls ?), and sandstones with occasional limestones, do not maintain a uniform thickness throughout, but are disposed in the form of lenticular beds, some of which appear to have exceptionally absorbtive properties.

The bores which have already been put down between the Darling Range and the Coast have shown how irregular are the strata from which the water has been obtained, and what is of further moment, they also demonstrate that in no instance has the base of the water-carrying beds been reached.

The first supply of artesian water in the vicinity of Perth was obtained some time during the year 1873, in a bore put down in the search for coal, under the advice of Mr. H. Y. L. Brown, then Government Geologist. The situation of the bore was somewhere near the Canning River, a few miles South-East of Perth, and close to the foot of the Darling Range. The following is a description of the material brought up from time to time, as determined by Mr. Brown :—

Canning River Bore.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Sand, gravel, sandy clay, and small boulders of igneous rocks, clay containing pyrites	16	0	...		"The sand and gravel in the above list, with the exception of that near the surface, must be considered mostly as coming from beds of sandstone and conglomerate which have been worked up by the action of the boring tools. In the same way the black and blue clay, when *in situ*, existed as shale. It is more than probable again that the rounded fragments brought up from certain depths had previously fallen down from a higher position." * Artesian water is still flowing from this bore.
Rounded granite pebbles, and gravel, grit, blue clay, and shale containing carbonised matter	25	0	16	0	
Gravel, sand, and pieces of quartz and granite; black clay with pyrites	23	0	41	0	
Rounded quartz, granite, grit, quartzite, and black clay with pyrites	29	0	64	0	
Rounded pieces of granite, and igneous rocks, gravel, sand, quartz, etc., with fragments of lignite	33	0	93	0	
Rounded fragments of igneous rocks, sand, etc.: yellow sandstone at 139 feet; coarse grit and sand at 171 feet	45	0	126	0	
Total	171	0	171	0	

* *H. Y. L. Brown*: On a Geological Exploration to the N.E. of Champion B *Western Australia*. Perth: By Authority, 1871, pp. 10-11.

Digitized by Google

In the year 1885, Mr. E. T. Hardman of Her Majesty's Geological Survey of Ireland, who at that time acted as Government Geologist, dealt fully with the question of supplying the city of Perth with artesian water, and after dealing with the principles of the construction of artesian wells, concluded that it would be hopeless to expect an overflowing supply of water anywhere in the neighbourhood. This conclusion was the only one which could be legitimately arrived at so long as it was assumed that the water-carrying strata must be arranged in the form of one of those ideal basins, sections of which have done duty for many years in geological manuals. Recent observations have shown that this condition rarely obtains in Nature, and that in all the important artesian areas the porous beds are so arranged that there is only one side of a synclinal trough present, and the water has abundant facilities for escape at a much lower level than that at which it is received.

So far, in this State, what may be called a true (*i.e.* a text-book) artesian basin is only known to occur on the Collie River, where a copious supply of water is at present flowing from Bores Nos. 2 and 3, put down with the object of testing the coal measures. From observations which have been made it would seem that the amount of water flowing from the bores on the Collie River increases and diminishes in a manner which points to dependence upon seasonal variations.

All the available information about artesian wells has been collected and is presented for reference in the following tables. So far as official data show, there are 23 artesian wells in the State, reaching an aggregate depth of 25,742 feet, and yielding a total flow of 5,192,504 gallons per diem, which is equivalent to 1,995,263,960 gallons per annum. In addition to these, there are five sub-artesian wells, of an aggregate depth of 4,574 feet, from which 1,637,700 gallons of water can be pumped daily, or 597,760,500 gallons per annum.

Digitized by Google

The Pound (near the Railway Station, Perth).

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Clay	38	0	...		
Coarse sandstone	27	0	38	0	
Clay	18	0	65	0	
Dark grey sandstone	18	0	83	0	
Clay	9	0	101	0	
Soft sandy marl	110	0	110	0	
Total	220	0	220	0	

West Perth Railway Station.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Drift sand	36	0	...		Altitude of bore, 37·71 feet above sea level. Yields 500,000 gallons per diem. Hydrostatic head, 77·71 feet above sea level; and 40 feet above surface. Hydrostatic pressure 17·32lbs. per square inch.
Clay	14	0	36	0	
Drift sand (incoherent sandstone)	9	0	50	0	
Clay	4	0	59	0	
Coarse drift (incoherent sandstone)	25	0	63	0	
Sandstone and clay	20	0	88	0	
Sandstone (with thin bands of shale)	718	0	108	0	
Total	826	0	826	0	

Subiaco Bore.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Sand	40	0	...		Altitude of bore, 117·15 feet above sea level. This bore was started from bottom of shaft, which is 103 feet deep. Sub-artesian water obtained: water rose in the bore to within 45 feet of natural surface. At 52 feet below the surface the overflow into the shaft is 161,000 gallons per diem. At 67 feet 10 inches below the surface the overflow into the shafts is 450,000 gallons per diem. Static head, 72 feet above sea level.
Sandstone with hard bands ...	63	0	40	0	
Sand and boulders	67	0	103	0	
Conglomerate (very hard) ...	10	0	170	0	
Soft sandstone	178	0	180	0	
Clayey and sandy shales ...	210	0	358	0	
Drift sand (incoherent sandstone)	98	0	568	0	
Clayey shale	60	0	666	0	
Soft sandstone	150	0	726	0	
Total	876	0	876	0	

Digitized by Google

Causeway Bore, Perth.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Shells and sand	42	0	...		At 824 feet yielded 22,000 gallons per diem. At 986 feet yielded 334,000 gallons per diem.
Sandstone	1	0	42	0	
Blue clay	13	0	43	0	
Sand	10	0	56	0	
Clay and gravel	17	6½	66	0	
Sand	38	5½	83	6½	
Sand and clay	119	5½	122	0	
White sand	56	3	241	5½	
White sand and black clay ...	9	3½	297	8½	
Hard band	49	0	307	0	
Sand drift	33	3	356	0	
Grey sandy shale	0	9	389	3	
Hard band	150	6	390	0	
Grey sandstone	0	11	540	6	
Hard band	16	11	541	5	
Grey sandstone	187	8	558	4	
Calcareous rock	1	1	746	0	
Mudstone	118	9	747	1	
Sand pocket	10	9	865	10	
Mudstone	109	5	876	7	
Total	986	0	986	0	

Perth Racecourse Bore.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Sandy clay	29	0	...		Altitude of bore, 40 feet above sea level. Yields 536,000 gallons per diem. Hydrostatic head 58·69 feet above sea level, and 18·69 feet above surface. Hydrostatic pressure, 8lbs. per square inch.
Yellow sand	11	0	29	0	
Stiff clay	4	0	40	0	
Sandstone	260	0	44	0	
Sandy shale with bands of sandstone	154	0	304	0	
Sandstone	309	0	458	0	
Sandstone with bands of clay shale	332	7	767	0	
Total	1,099	7	1,099	7	

Digitized by Google

Leederville Bore.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Sand (incoherent sandstone) with three bands	130	0	...		Yield, 288,000 gallons per diem. Pressure in lbs. per square inch 4·75. Static head above surface in feet 11·33. Surface of ground above sea level 58·85 feet. Depth of principal water-bearing strata, 1,023 feet.
Calcareous sandstone	23	0	130	0	
Limestone	5	6	153	0	
Calcareous sandstone	47	6	158	6	
Shell marl	691	6	206	0	
Sandstone	8	6	897	6	
Calcareous shales, with one band of calcareous sandstone ...	103	4	906	0	
Calcareous sandstone with two bands of sandstone	103	11	1,009	4	
Total	1,113	3	1,113	3	

South Perth Bore.

Nature of Strata.	Thickness.		Depth.		Remarks
	ft.	in.	ft.	in.	
Sand (incoherent sandstone ?) ...	75	0	...		Output, 372,384 gallons per diem. Pressure in lbs. per square inch 44·5. Static head above surface in feet 102·75. Surface of ground above sea level 18·01 feet. Depth of principal water-bearing strata 1,837 feet.
Calcareous shale	142	0	75	0	
Sand (incoherent sandstone ?) ...	263	0	217	0	
Calcareous shales with five (5) hard bands	1,351	0	480	0	
Sand (incoherent sandstone) ...	29	6	1,831	0	
Total	1,860	6	1,860	6	

Melville Water Park Estate Bore.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
White sand	31	0	...		Altitude of bore, 9·44 feet above sea level. Yields 140,000 gallons per diem. Hydrostatic head, 49 feet above sea level; and 39·56 above surface. Hydrostatic pressure, 17lbs. per square inch. Temperature of water, 91° Fahrenheit.
Sands and clays	184	0	31	0	
Sandy calcareous shales with fossils	78	0	215	0	
Sandstone	15	0	293	0	
Sandy shale	59	6	308	0	
Sandstone	77	6	367	6	
Sandy shale, with occasional calcareous bands	947	6	445	0	
Drift sand and shale, with nodules of pyrites and quartz boulders	16	0	1,392	6	
Sandstone and grit	78	6	1,408	0	
Sand	3	6	1,486	6	
Total	1,490	0	1,490	0	

Digitized by Google

Water Hall Estate Bore, Guildford (J. Morrison).

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Dark soil	3	0	...		Altitude of bore, 35·02 feet above sea level. Yields 200,000 gallons per diem. Hydrostatic head, 46 feet above sea level, and 10·98 feet above surface. Hydrostatic pressure, 4·75lbs. per square inch.
Clay, gravel, and cement ...	48	0	3	0	
Clay	77	0	51	0	
Sandstone (drift sand)	105	0	128	0	
Clay shale	30	0	233	0	
Sandstone with band of shale ...	126	0	263	0	
Clay shale	67	0	389	0	
Alternations of sandstone and clay shale	235	0	456	0	
Total	691	0	691	0	

Bebo Moro Bore, Guildford (H. E. B. Gull).

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Clay	6	0	...		Altitude of bore, 19·46 feet above sea level. Yields 80,000 gallons per diem. Hydrostatic head, 37 feet above sea level, and 17·54 feet above surface. Hydrostatic pressure, 7·50lbs. per square inch.
Sand and clay	62	0	6	0	
Sandstone	95	0	68	0	
Clay	101	0	163	0	
Loam and sand	7	0	264	0	
Black clay	39	0	271	0	
White sand (? incoherent sandstone)	8	0	310	0	
Black clay	33	0	318	0	
Clay and loam	5	0	351	0	
Drift sand (? incoherent sandstone)	52	0	356	0	
Ironstone gravel	...		...		
Total	408	0	408	0	

Woodbridge Estate Bore, Guildford (C. Harper).

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Dark loam	10	0	...		Altitude of bore, 14·30 feet above sea level. Yields 150,000 gallons per diem. Hydrostatic head. 33 feet above sea level, and 18·30 feet above surface. Hydrostatic pressure, 7·92lbs. per square inch.
Drift sand (? incoherent sandstone)	59	0	10	0	
Clay and loam	60	0	69	0	
Drift sand (? incoherent sandstone)	18	0	129	0	
Clay and loam	13	0	147	0	
Drift sand	76	0	160	0	
Total	236	0	236	0	

Digitized by Google

Municipal Bore at Guildford.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Blue and yellow clays and gravel	34	0	...		Altitude of bore, 11·37 feet above sea level. Yields 1,120,000 gallons per diem. Hydrostatic head, 64·55 feet above sea level, and 53·18 feet above the surface. Hydrostatic pressure. 23lbs. per square inch.
Sand	6	0	34	0	
Black clays	10	0	40	0	
Sand and water-worn pebbles ...	25	2	50	0	
Black sandy clay	147	7	75	2	
Sand and sandstones impregnated with pyrites	792	3	222	9	
Sand with layers of shale ...	187	0	1,015	0	
Total	1,202	0	1,202	0	

Lockeridge Estate Bore, Guildford (H. Hamersley).

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Surface *debris*	1	6	...		Altitude, 14·29 feet above sea level. Yields 123,000 gallons per diem. Hydrostatic head, 21 feet above sea level, and 7 feet above surface. Hydrostatic pressure, 3·03lbs. per square inch.
Clay and sandstone bands ...	13	6	1	6	
Drift sand (? incoherent sandstone)	25	0	15	0	
Clay (? shale)	16	0	40	0	
Sand (? incoherent sandstone) ...	27	6	56	0	
Decomposed ironstone	2	0	83	6	
Dark clay shales with coal veins	146	0	85	6	
Sand (? incoherent sandstone) ...	7	6	231	6	
Clay shale	12	0	239	0	
Drift sand (? incoherent sandstone)	10	0	251	0	
Clay shale	14	0	261	0	
Drift sand (? incoherent sandstone)	28	0	275	0	
Clay shale	16	0	303	0	
Drift sand (? incoherent sandstone)	50	0	319	0	
Sandstone (with three thin bands of clay shale)	304	0	369	0	
Clay shale	32	0	673	0	
Sand (? incoherent sandstone) ...	8	0	705	0	
Clay shale	23	0	713	0	
Sand (? incoherent sandstone, with bands of clay shale) ...	62	0	736	0	
Total	798	0	798	0	

Digitized by Google

J. H. Munday's Bore, Guildford.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Chocolate soil	2	0	...		Yields 70,000 gallons per diem.
Clay	23	0	2	0	
Coarse sand	2	0	25	0	
Black clay	58	0	27	0	
Coarse sand and waterworn pebbles	1	0	85	0	
Black clay with green bands ...	193	0	86	0	
Green clay and sand	10	0	279	0	
Compressed sand	2	0	289	0	
Green clay and sand	16	0	291	0	
Drift sand	15	0	307	0	
Compressed sand (sandstone ?) ...	2	10	322	0	
Total	324	10	324	10	

Midland Junction Bore.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Sand and clay ...	21	0	...		Altitude of bore, 13 feet above sea level. Between 60 feet and 71 feet, 5,000 gallons of water per diem rose to 4 feet above the surface. Between 98 feet and 107 feet, 8,900 gallons per diem rose to 5 feet above the surface. Between 166 feet and 246 feet, water at the rate of 129,600 gallons per diem overflowed with a hydrostatic head of 12 feet. Between 262 feet and 350 feet water at the rate of 151,000 gallons per diem overflowed with a hydrostatic head of 18·7 feet. Between 363 feet 6 inches, and 419 feet, water at the rate of 100,000 gallons per diem overflowed with a hydrostatic head of 18·7 feet. The water-bearing beds, which are being drawn upon for the Midland Junction supply, are those between 262 feet and 350 feet, and 363 feet and 420 feet. All the others are shut off. Hydrostatic pressure, 8·66lbs. per square inch.
Sandstone ...	86	0	21	0	
Sandy shale ...	59	0	107	0	
Grey sandstone ...	80	0	166	0	
Arenaceous clay shale	16	0	246	0	
Grit and clay shale	88	0	262	0	
Clay shale ...	13	0	350	0	
Sandstone and clay shale	56	0	363	0	
Clay shale ...	81	0	419	0	
Total ...	500	0	500	0	

Digitized by Google

Hampton Road Bore No. 1, Fremantle.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Porous sandstone	34	0	...		Altitude of bore, 63 feet above sea level. Yields a sub-artesian supply of 668,000 gallons per diem. Hydrostatic head, 24·50 feet above sea level. Depth of the water level below the surface 38·50 feet. The temperature of the water is 80° Fahrenheit.
Sandstone ...	69	7	34	0	
Limestone ...	2	0	103	7	
Sandstone ...	7	3	10[illegible]	7	
Limestone ...	7	2	112	10	
Grey sandstone ...	11	6	120	0	
Limestone ...	3	2	131	6	
Grey sandstone ...	5	3	134	8	
Sandstone ...	2	11	139	11	
Limestone ...	2	6	142	10	
Sandstone ...	3	0	145	4	
Limestone conglomerate ...	2	0	148	4	
Sand	5	7	150	4	
Sandstone ...	5	0	155	11	
Limestone ...	4	0	160	11	
Dark sandstone ...	27	6	164	11	
Black clay ...	78	9	192	5	
Sandstone ...	50	11	271	2	
Black clay ...	14	0	322	1	
Dark sandstone ...	42	4	336	1	
White sand ...	31	7	378	5	
Green sandstone	25	0	410	0	
Coarse sand ...	20	6	435	0	
Total ...	455	6	455	6	

Several bores have been put down in the neighbourhood of Bunbury, and artesian water obtained at comparatively shallow depths. Southwards from Point Casuarina, and to the West of the town, is a narrow fringe of columnar basalt rising from beneath the sea level, but forming no conspicuous elevation. Basalt is, however, known at Black Point, and at one or two places on the mainland between that place and the town of Bunbury. To the basalt succeeds a long irregular line of sand dunes, upon the highest point of which, Marlston Hill, the light-house is placed. By far the larger portion of Bunbury, however, is built upon an extensive alluvial flat, whose surface is raised but little above the high-water mark.

Bore No. 1, situate at the Eastern end of Stephen Street, and about half-a-mile West of the outcrop of the basaltic lava, was carried down to a depth of 30ft. The drill entered the basalt after passing through 10ft. of superficial deposits, and was carried down through it for a further distance of 20ft., when operations ceased, there being some doubts as to whether the rock was disposed in the form of a bed or beds. The section in bore at the Bunbury Brewery, below Marlston Hill, proves that the basalt is in

Digitized by Google

the form of beds, but boring operations have not been carried deep enough to show whether the clay beneath the lava is merely a thin bed dividing two individual lava flows, or is the old floor upon which the basalt was laid down.

The following are the particulars in connection with the strata pierced in these bores, together with other cognate points :—

Bunbury Bore No. 1.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Superficial deposits	10	0	...		Bore abandoned.
Basaltic lava	20	0	10	0	No water.
Total	30	0	30	0	

Bunbury Bore No. 2.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Surface clay	2	0	...		Altitude of bore, 2 feet above sea level. At a depth of 97 feet a sub-artesian supply, capable of yielding 70,000 gallons per diem, was encountered.
Black clay	7	0	2	0	
Sand	2	4	9	0	
Cement	0	3	11	4	
Coarse sand	5	5	11	7	
Yellow clay	2	0	17	1	
Sand	5	0	19	0	
Hard yellow clay	2	6	24	0	
Coarse white sand...	5	0	26	6	
Cemented sand	0	3	31	6	
Stiff dark clay	3	9	31	9	
Coarse sand and gravel	21	9	35	6	
Cemented sand	3	0	57	3	
Sand	5	0	57	6	
Yellow clay	5	0	62	6	
Sand	36	6	67	6	
Total	104	0	104	0	

Digitized by Google

Bunbury Bore No. 3.

Nature of Strata.	Thickness.	Depth.	Remarks.
	ft. in.	ft. in.	
Clay	10 0	...	Altitude of bore. 2 feet above sea level. The sandstone at 86 feet yielded an overflowing supply of 10,000 gallons per diem. The principal supply is drawn from the sand at the bottom of the well. The total yield is 100,000 gallons per diem. Hydrostatic head untested.
Yellow sand	14 0	10 0	
Ironstone conglomerate	0 10	24 0	
Hard clay	4 0	24 10	
Sand and cement	2 0	28 10	
Soft sandstone	2 0	30 10	
Clay (shale?)	5 0	32 10	
Sandstone	8 0	37 10	
Clay (shale?)	8 0	45 10	
Sandstone	13 0	53 10	
Clay (shale?)	4 0	66 10	
Sandstone	23 0	70 10	
Yellow clay (shale?)	6 0	93 10	
Coarse sand (incoherent sandstone)	18 0	99 10	
Hard yellow clay (shale?) ...	16 0	117 10	
Coarse sand (incoherent sandstone)	17 0	133 10	
Yellow clay (shale?)	5 0	150 10	
Coarse sand (incoherent sandstone)	25 0	155 10	
Sandstone	68 0	180 10	
Gravel (conglomerate?)	2 0	248 10	
Soft yellow clay (shale?) ...	2 0	250 10	
Drift sand (incoherent sandstone)	23 0	252 10	
Gravel (conglomerate)	1 0	275 10	
Blue pipeclay (shale?)	32 0	276 10	
Drift sand (incoherent sandstone?)	71 0	308 10	
Pipeclay (shale?)	0 4	379 10	
Drift sand (incoherent sandstone)	36 6	380 2	
Total	416 8	416 8	

Bunbury Brewery Bore.

Nature of Strata.	Thickness.	Depth.	Remarks.
	ft. in.	ft. in.	
Sand and surface *débris*	12 0	...	The bore was commenced at the foot of a well, and a depth of 112 feet from the surface attained. The water, which rises to about the top of the basalt at a depth of 12 feet from the surface, is of excellent quality, and is said to be well suited for brewing purposes.
Basalt	97 0	12 0	
Clay	3 0	109 0	
Total	112 0	112 0	

The beds of the coastal plain further to the North, in the neighbourhood of Geraldton, have been explored by means of bores. Three bores have been put down—two at Geraldton, and one at *Dongara, near the* mouth of the Moore River.

Digitized by Google

The country in the vicinity of Geraldton is composed of sandy limestones, very little disturbed from the position in which they were originally laid down. The calcareous strata are in places covered with deposits of blown sand. To the East of Geraldton the limestones rest upon the old crystalline rocks, which are absolutely impervious to water below the zone of decomposition. Owing to the horizontality of the strata the basal beds of the coastal limestone series do not crop out anywhere near the junction of the limestone and the older rocks, but merely abut against the underground continuation thereof. Horizontal tablelands of grit and conglomerate, resting on granite and gneissic rock, form conspicuous landmarks in the neighbourhood. Some of the tablelands rise to considerable elevations above the level of the surrounding country. Many of the grits are sufficiently open and porous to be capable of absorbing and transmitting water were they disposed in such a way as to admit of this.

A bore was put down in the station yard at Geraldton, and operations were continued to a depth of 420 feet, when the old granitic floor was reached. The strata pierced were shales and sandstones of the ordinary type. None of the beds yielded a supply of artesian water.

Geraldton Station Yard Bore.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Sand	24	0	...		Altitude, approximately, 10 feet above sea level. No water.
Conglomerate	42	0	24	0	
Soft sandstone	10	0	66	0	
Conglomerate	15	0	76	0	
Sandstone	10	0	91	0	
Shale	3	0	101	0	
Sandstone and shale	25	0	104	0	
Conglomerate	0	4	129	0	
Coal	0	10	129	4	
Sandstone	4	0	130	2	
Clay with coal veins	3	6	134	2	
Coarse white sand with boulders	23	0	137	8	
Clay with coal veins	0	10	160	8	
Clay	5	0	161	6	
Pyrites (?)	2	1	166	6	
Grey shale	29	0	168	7	
Sandstone with coal veins ...	9	0	197	7	
Sandstone (soft)	20	0	206	7	
White clay	12	0	226	7	
Pyrites (?) and boulders ...	2	0	238	7	
Sandstones and pyrites	5	0	240	7	
Sandstone	6	0	245	7	
Clay	25	0	251	7	
Sandstone and shale	42	0	276	7	
White clay	5	0	318	7	
Clay with sandstone and pyrites (?), in bands	32	0	323	7	
Clay	17	0	355	7	
Blue shale	45	0	372	7	
Granite	2	6	417	7	
Total	420	1	420	1	

Digitized by Google

The scene of boring operations was eventually shifted to the racecourse at Geraldton, and a depth of 1,153 feet obtained. The result proves the existence, hitherto unsuspected, of a subterranean granitic ridge, which, on carefully weighing all the evidence, seems to trend generally North and South. The following are the particulars in connection with the strata pierced :—

Geraldton Racecourse Bore.

Nature of Strata.	Thickness of Strata.		Depth from surface.		Remarks.
	ft.	in.	ft.	in.	
Clays	5	0	...		Altitude of bore, 82 feet above sea level. A pumping supply of 11,700 gallons of very salt water met with at a depth of 72·9 feet. The water rose to a height of 45 feet below the surface.
Red and yellow sands	29	0	5	0	
Red clay	2	0	34	0	
Gravel	0	6	36	0	
Blue and red clays	7	6	36	6	
Red gravel with fragments of decomposed limestone	5	0	44	0	
Sand...	4	0	49	0	
Blue clays	12	0	53	0	
Sand with small bands of clay and pyrites intermixed... ...	72	0	65	0	
Drift sand (incoherent sandstone)	13	6	137	0	
Ferruginous conglomerate ...	3	6	150	6	
Sandstone	12	0	154	0	
Clay	1	0	166	0	
Sandstone	19	0	167	0	
Shell limestone	21	0	186	0	
Sandstone	4	0	207	0	
Shell limestone	5	0	211	0	
Blue clay	5	0	216	0	
Shell limestone	3	0	221	0	
Sandstone	3	0	224	0	
Loose sand (incoherent sandstone) with bands of shale intermixed	4	0	227	0	
Shell limestone	2	0	231	0	
Conglomerate	6	0	233	0	
Sandstone with bands of shell, shale, and pyrites	57	0	239	0	
Conglomerate containing petrified wood	1	0	296	0	
Sandstone containing bands of shale and pyrites	39	0	297	0	
Sandstone (incoherent sandstone?) with coal seams intermixed	8	0	336	0	
Sandstone containing bands of shale	13	0	344	0	
Conglomerate	12	0	357	0	
Dark shale	5	0	369	0	
Coal seam	0	6	374	0	
Dark shale	3	0	374	6	
Conglomerate	1	6	377	6	
Shale with bands of coal intermixed	14	0	379	0	
Argillaceous sandstone with bands of pyrites	7	0	393	0	
Limestone with bands of grey shale	20	0	400	0	
Dark shale...	10	0	420	0	

Digitized by Google

Geraldton Racecourse Bore—continued.

Nature of Strata.	Thickness of Strata.		Depth from surface.		Remarks.
	ft.	in.	ft.	in.	
Limestone with bands of light grey shale	16	0	430	0	
Shale with fragments of coral limestone	3	0	416	0	
Limestone	6	0	449	0	
Dark shale with bands of sandstone	32	0	455	0	
Shale	3	0	487	0	
Sand (incoherent sandstone?) ...	40	0	490	0	
Conglomerate	2	0	530	0	
Sand (incoherent sandstone?) ...	9	0	532	0	
Conglomerate	9	0	541	0	
Shale	2	0	550	0	
Conglomerate with bands of pyrites	43	0	552	0	
Sand (incoherent sandstone?) ...	10	0	595	0	
Fine silt	13	0	605	0	
Conglomerate	10	0	618	0	
Sandstone	12	0	628	0	
Argillaceous limestone	45	0	640	0	
Conglomerate and bands of pyrites	12	0	685	0	
Sandstone (incoherent sandstone)	4	0	697	0	
Argillaceous limestone	14	0	701	0	
Sand (incoherent sandstone?) ...	10	0	715	0	
Argillaceous limestone	5	0	725	0	
Hard grey sandstone	3	0	730	0	
Red shale	2	0	733	0	
Sandstone with bands of shale ...	5	6	735	0	
Red shale	3	6	740	6	
Sandstone with bands of shale and conglomerate intermixed ...	219	0	744	0	
Shale	4	0	963	0	
Sandstone	15	0	967	0	
Shale	2	0	982	0	
Hard grey sandstone with bands of shale	27	0	984	0	
Red shale	12	0	1,011	0	
Sandstone with thin bands of shale	44	0	1,023	0	
Red shale	9	0	1,067	0	
Sandstone and shale	4	0	1,076	0	
Conglomerate	11	0	1,080	0	
Sandstone with bands of shale and pyrites	76	0	1,091	0	
Shale	17	0	1,167	0	
Sandstones and thin shales ...	75	0	1,184	0	
Conglomerate	10	0	1,259	0	
Alternations of sandstone and shale	177	0	1,269	0	
Calcareous shale and argillaceous limestone	28	0	1,446	0	
Sandstone	52	6	1,474	0	
Siliceous crystalline limestone ...	0	9	1,526	6	
Coarse sandstone	4	3	1,527	3	
Total	1,531	6	1,531	6	

Digitized by Google

The whole country along the coast from Geraldton to Dongara is made up of the coastal limestone series which rise in the form of sand plains to an altitude of about 500ft. These beds effectually conceal the underlying rocks, and at the few places where these are seen a low dip to the West is observable. From Geraldton the coastal limestone series widens out and covers an extensive area of country, which attains its maximum width on the Irwin River.

A Government bore was put down, near the mouth of the Irwin River at Dongara, to a depth of 2,111ft.

The following is a section of the strata pierced as compiled from the bore journals supplied by the Department of Public Works:—

Dongara Bore.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft.	in.	
Sand	6	0	...		At a depth of 149 feet, water was met w th in a bed of sands one, and stood at 17 feet from the surface. On further boring to a depth of 935 feet the water rose within 2 feet 6 inches of the surface. When operations had reached 1,023 feet in a coarse, grey sandstone, the water rose to the surface. The first overflowing supply was encountered in a micaceous sandstone at a depth of 1,259 feet 7 inches, the yield being 128 gallons per hour; this flow increas d to 240 gallons per hour at a depth of 1,327 feet, the water being obtained from a bed of micaceous sandstone. Fresh water, flowing at the rate of 3,600 gallons per hour, was met with at 1,384 feet. The water, which is said to have flowed from a micaceous shale, issued with a temperature of 98 degrees, and rose 22 feet above the surface.
Clay	3	6	6	0	
Sandstone	50	6	9	6	
Limestone	12	0	60	0	
Sandstone	23	0	72	0	
Clay	45	0	95	0	
Micaceous sandstone	90	0	140	0	
Drift sand (incoherent sandstone?)	30	0	230	0	
Sandstone with coal seams ...	45	0	260	0	
Carbonaceous shale	4	0	305	0	
Sandstone	110	0	309	0	
Sandstone with veins of coal ...	15	4	419	0	
Sandstone	42	8½	434	4	
Sandstone with bands of carbonaceous shale	12	9	477	6½	
Sandstone	42	11	489	9½	
Grey shale	2	0	532	8½	
Sandstone	705	11½	534	8½	
Shale	9	11	1,240	8	
Sandstone with thin shale band	124	10	1,250	7	
Micaceous shale	28	7	1,375	5	
Sandstone	88	6	1,404	0	
Shale	57	3	1,492	6	
Sandstone	100	0	1,549	9	
Micaceous shale	82	7	1,649	9	
Sandstone	379	3	1,732	4	
Total	2,111	7	2,111	7	

Digitized by Google

A bore was put down at Onslow to a depth of about 1,729 feet, but it was not very successful, hence its abandonment. The particulars in connection with this bore are as follows:—

Onslow Bore.

Nature of Strata.	Thickness.		Depth.		Remarks.
	ft.	in.	ft	in.	
Sand	30	0	...		Water struck at 1,015 feet, which trickled over the surface at the rate of 20 to 30 gallons per diem. At 1,717 feet yields 120 gallons per diem. Hydrostatic pressure, 10·82lbs. per square inch. Hydrostatic head, 25 feet above surface. Water salt.
Limestone	183	10	30	0	
Calcareous shale	30	11	213	10	
Grey shale	361	8	244	9	
Grey dolomite	34	10	606	5	
Grey shale	731	3	641	3	
Dark grey marl	82	6	1,372	6	
Sandstone	0	10	1,455	0	
Clay (? shale)	21	2	1,455	10	
Dark grey marl	66	0	1,477	0	
Clay (? shale)	3	1	1,543	0	
"Hard stone" (?)...	0	8	1,546	1	
Sandstone	9	6	1,546	9	
"Hard rock"(?)	0	3	1,556	3	
Shale	6	2	1,556	6	
Calcareous shale	5	4	1,562	8	
Shale	70	8	1,568	0	
Black argillaceous limestone ...	0	4	1,638	8	
Shell marl	53	1	1,639	0	
Shale	4	0	1,692	1	
Black argillaceous limestone ...	2	0	1,696	1	
Shale	14	5	1,698	1	
Clay and sand	8	6	1,712	6	
Basalt	2	0	1,721	0	
Marl	5	10	1,723	0	
Total	1,728	10	1,728	10	

In addition to the above, numerous shallow bores have been put down in the Eastern Agricultural Districts. The wells put down have derived their supplies from those superficial deposits which are surcharged with water, and which cover an extensive area of country. The supply yielded by these wells is directly dependent upon the saturation of the ground immediately surrounding them, and is in no sense artesian. Full details in connection with these wells have already been published,* and need not be further referred to.

The information in connection with this subject has been thrown into a tabular form for convenience of reference.

* A. Gibb Maitland. Proposed boring for artesian water in the Eastern Agricultural Districts. Annual Progress Report of the Geological Survey for the Year 1898, Perth: By Authority, 1899, pp. 22-29.

Digitized by Google

Table of Deep Bores—Artesian and Sub-artesian (compiled from Official Records).

Locality.	Local Name (if any) of Bore.	Surface of Ground above sea level to nearest foot.	Total depth of Bore in feet.	Depth to principal water-bearing bed below surface in feet.	Temperature of water, Fah. degrees.	Static head above sea level in feet.	Artesian. Continuous daily flow in gallons when uncontrolled.	Artesian. Static pressure in lbs. per square inch at surface.	Static head above surface in feet.	Sub-artesian. Depth of water level below surface in feet.	Sub-artesian. Volume pumped or available daily in gallons.
1	2	3	4	5	6	7	8	9	10	11	12
Wyndham	... ...	35	690	...	...	...	Bore abandoned	no water.			
Town of Onslow ...	... ...	...	1,729	1,015	...	...	120	10·82	25·00	...	...
Carnarvon	Pelican Hill Bore	Work in hand.									
Geraldton	Geraldton Station Yard ...	* 10	42)	...	...	...	Bore abandoned	no water.			
Victoria	Geraldton Racecourse ...	* 82	1,531	1,531	...	...	...	...	...	45	11,700
Dongara	... ...	* 35	2,111	1,478	104°	57·00	216,000	9·54	22·00	...	...
Irwin	Yardarino	* 155	1,607	1,607	86°	130·00	...	...	...	25	50,000
Swan	Midland Junction	13	500	420	...	33·20	266,000	8·66	20·20	...	...
Swan	Woodbridge	14	236	160	...	33·00	150,000	7·92	18·30	...	...
Swan	Bebo Moro	19	408	408	...	37·00	80,000	7·50	17·54	...	...
Guildford	Lockeridge or Hamersley's	14	798	784	...	21·00	123,000	3·03	7·00	...	...
Swan	Waterhall	35	691	691	...	46·00	200,000	4·75	10·98	...	...
Guildford	Municipal	11	1,202	1,140	...	64·55	1,120,000	23·00	53·18	...	...
Guildford	Mr. Munday's	22	340	304	75°	31·74	70,000	4·35	10·00	...	...
Guildford	Mr. Butcher's				No	particulars	available.				
Swan	Perth Racecourse	40	1,100	1,070	...	58·99	536,000	8·00	18·69	...	...
Perth	Cricket Association Ground	13	948	948	...	61·89	281,000	21·22	49·00	...	...
Swan	Leederville Recreation Ground	59	1,113	1,023	...	70·18	288,000	4·75	11·33	...	...
Perth	Perth Station Yard	38	820	820	...	77·71	500,000	17·32	40·00	...	...
Suburban Allotment	Subiaco	117	876	876	...	72·00	...	...	...	45	450,000
South Perth ...	... ...	18	1,856	1,837	...	120·76	372,384	44·50	102·75	...	...
Causeway	... ...	...	986	877	...	...	334,000	...	...	..	...
Perth (East) ...	Electric Tramways	...	1,034	...	...	...	350,000	...	...	...	...
Canning	Melville Water Park Estate	9	1,487	1,487	91°	49·00	140,000	17·00	39·56	...	...
Cannington ...	Mr. Brookman's	...	1,000	...	...	...	400,000	...	...	...	...
Fremantle	Hampton Road No. 1 ...	63	1,200	434	80°	24·50	...	...	...	38·50	1,056,000
Bunbury	Railway Station	2	39	...	...	Abandoned.					
Bunbury	Government Grant on Estuary	2	104	97	...	...	...	...	...	97	70,000
Bunbury	Res. 2030, Stirling Street ...	2	416	86	...	Untested ..	100,000	...	...	...	...
Dardanup	Mr. Venn's (No. 1)	* 85	453	...	...	Abandoned.					
Dardanup	Mr. Venn's (No. 2)	* 85	1,032	...	...	Abandoned.					

NOTES.—The Dongara Bore, though included here for convenience, was really put down to test the Coal Measures. * This ground level is approximate.

Digitized by Google

The following table gives the analyses of water from certain of the artesian wells of the State. These were made for the sole purpose of determining the suitability of the waters for domestic use, and are in many particulars incomplete from a mineral point of view:—

*Chemical Analyses of Water from Artesian Wells.**

(Analyst: E. A. MANN.)

No. of Analysis.	Locality of Bore.	Grains per Gallon.											Grains per 100,000.				
				Carbonates.		Chlorides.			Sulphates.				Ammonia.		Oxygen absorbed.		
		Total Solids.	Alumina and Iron.	Calcium $CaCO_3$	Magnesium $MgCO_3$	Sodium NaCl.	Magnesium $MgCl_2$	Total Chlorine.	Calcium $CaSO_4$	Magnesium $MgSO_4$	Reaction.	Degree of hardness.	Free.	Albuminoid.	In 15"	In 4 hours.	Nitrogen Nitrates.
1	Gorald'on Station Yard ...	12·77	..	9·8	1·2	907·2	173·1	122·5	61·9	...	...	...	...	...	...	...	1·3
2	Dongara	...	...	...	...	1066·5	...	607·6	...	...	...	...	..	...	...	...	...
3	Do.	...	...	...	...	602·43	...	365·1	...	...	...	...	...	...	...	...	...
4	Water Hall Estate ...	51·24	...	...	...	...	...	...	...	...	...	7·0°	·005	·003	·047	·063	...
5	Municipal Bore, Guildford	36·12	...	...	...	14·5	...	...	...	...	...	7·0°	·007	·0·7	...	...	...
6	Do. do.	93·6	1·55	5·95	..	73·88	...	...	888·5	...	Alk.	11·5°	·014	·003	·01	...	·011
7	Do. do.	87·22	...	...	...	...	...	39·2	...	...	...	12·0°	·0145	·0 85	...	...	...
8	Perth Cricket Asn. Ground	..	...	...	...	...	...	...	...	...	...	...	·02	·001	...	·013	·024
9	Leederville Asn, Ground	39·9	..	...	...	...	...	19·4	...	...	...	3·0°	·017	·001	...	·07	·033
10	Perth Station Yard ...	34·72	...	...	...	...	...	15 12	...	...	...	7·5°	·04	·011	...	...	...
11	Do.	44·34	2·896	8·568	...	32·67	...	...	2·198	...	...	...	·02	·0015	...	·019	·027
12	Do.	...	...	..	...	...	...	...	...	...	...	...	·015	·002	...	..	...
13	Subiaco	...	...	...	...	...	...	..	...	...	..	...	·06	·046	...	·27	...
14	Perth, Wellington St. Bore	...	..	...	...	...	...	...	..	...	...	...	·013	·008	...	...	...
15	Do. do.	...	...	...	...	...	...	...	...	...	...	...	·018	·006	...	...	...
16	Do. do.	34·27	2·06	6·244	...	23·436	...	...	2·268	...	...	...	·0185	·0025	...	·015	·050
17	South Perth	16·1	..	..	...	...	...	6·02	...	...	...	2·5°	...	...	...	...	...
18	Do.	66·08	.	...	...	...	...	30·1	...	...	...	4·0°	·03	·002	...	·064	·02
19	Melville Water Park Estate		..	...	...	..	...	...	...	...	...	...	·062	·005	...	...	...
20	Collie Bore (? 2 or 3) ...	16·1	.	..	...	..	...	...	...	...	...	...	·009	·0125	·012	·0132	...
21	Do. ,, ,, ...	21·07	..	...	..	...	...	...	...	...	..	...	·0125	·011	·012	·0512	...
22	Do. ,, ,, ...	12·04	...	..	...	...	...	..	...	...	...	...	·0135	·0155	·012	·01807	...
23	Do. ,, ,, ...	20·44			...	...	...	...	...	...	...	...	·0285	·0125	·0 15	·0361	...
	Bunbury (2) Bore .	21·42	8·19	3·587	...	21·162	...	..	...	1·18	...	...	..	...	...	...	...

* Annual Report of the Department of Public Works for the Year 1898-99. Perth: By Authority, 1899, p. 52.

THE METROPOLITAN WATER WORKS.

(Particulars supplied by the Secretary, Metropolitan Waterworks Board.)

Active work in connection with the Perth Water Supply Company started in May, 1889, the reservoir being completed and water delivered into the town in October, 1890.

The Metropolitan Water Works were purchased for the sum of £220,000, under Act No. 19 of the 60th Victoria, assented to 8th October, 1896.

Under the provisions of this Act the Metropolitan Water Works Board were empowered—subject to the approval of the Governor—to borrow £350,000 at the rate of 4 per cent. per annum, the money so borrowed to be expended in the first place on the purchase of the works, which then belonged to a private corporation, the balance being devoted to their extension or to such other purpose as the Governor might, on the recommendation of the Board, authorise and approve. An amending Act, passed in 1898, sanctioned an increase of the capital to £400,000.

The Board up to the 30th of June, 1901, had expended £386,951 on construction, and £91,022 on maintenance, etc., making a total expenditure of £477,973.

The works are intended to supply the City of Perth and suburbs (including Subiaco, Leederville, Victoria Park, and North Perth) with water for domestic purposes.

The site and source of supply is at Mundy's Brook, in the Darling Range, where water is impounded by a concrete dam capable of holding 200,000,000 gallons, this being augmented by a further supply taken from three artesian bores. It is now proposed to construct a concrete weir in the Canning River, 100ft. high, with a gross storage capacity of 1,554,452,000 gallons. This proposal has not, however, as yet been authorised, but surveys have been made and plans prepared for the information of the board.

There are two mains from the supply dam to the Perth Service Reservoir on Mount Eliza, overlooking the city, which has a capacity of 2,413,000 gallons, one of 12in. pipe 17 miles in length, and the other 21in. in diameter and 15½ miles in length. The reticulation pipes, from 3in. to 12in., are 79 miles long, in addition to which there are 23½ miles of tubing from ½in. to 2in. in diameter. During the year ended 30th June, 1901, seven miles and seventeen chains of piping from 1in. to 8in. in diameter were laid in Perth and suburbs. During the same period the Board supplied 541,592,245 gallons to its customers. Of this quantity 161,589,245 gallons were artesian waters obtained from three bores—one in Wellington Street, Perth, one in Leederville, and one in Subiaco.

The revenue of the board from the 1st November, 1896, to the 30th June, 1901, was £97,740.

Digitized by Google

FREMANTLE WATER SUPPLY.

Fremantle and its suburbs are supplied from wells located in the Prison Reserve; the water is pumped by hand and steam power into two service reservoirs, one situated in the Prison Reserve and the other near Monument Hill; these reservoirs have a capacity of 330,000 and 1,000,000 gallons respectively. From thence over 38 miles of pipes are laid, and water is supplied by gravity for domestic purposes, the railways, shipping, and harbour works.

The works are completed, with the exception of further reticulation extension. Since December, 1898, 26 miles of main and reticulation pipes have been laid, and the soakage drives were extended 400ft., making the present total length of these drives 2,800ft.

Two triple-expansion condensing pumping engines were installed in 1898, capable of raising 1,000,000 gallons of water per day of 16 hours.

An elevated tank of 12,000 gallons capacity has been erected for the purpose of reticulating the higher portions of the town.

Digitized by Google

WATER SUPPLY FROM RESERVOIRS OR WELLS (EXCLUSIVE OF PERTH AND FREMANTLE, FOR WHICH SEE SEPARATE STATEMENTS).

Locality.	Object of Work.	Nature of Work.	Capacity of Reservoirs in gallons.	Remarks.
Wyndham	Domestic and stock supply	Well, windmill, pump, etc.	...	Well, 97ft. deep.
Derby...	Do. do. ...	Do. do. do.	1,800	
Do.	Jetty and domestic supply	Do. do. do.	25,000	Completed.
Broome	Do. do. ...	Do. do. do.	15,000 25,000	Steam pump proposed.
Newcastle	Domestic supply	Reservoir	1,250,000	Completed.
Northam	Stock supply	Dams in river	...	Drawings prepared and handed over to Town Council.
Greenbushes... ...	Domestic supply	Well	...	Well sunk and timbered.
Greenbushes South...	Do. do.	Do.	...	Well sunk and timbered, reticulation proposed.
Mary Ann Harbour...	Do. do.	Do.	...	Well sunk.
Ravensthorpe ...	Do. do.	Well and condenser	...	Well sunk, condenser erected.
Harbour View ...	Do. do.	Do. do.	...	Do. do.
Albany	Do. do.	Pumping and gravitation	253,000 and 67,000	Surveys made, gauging work carried out, and reports and estimates furnished; scheme in abeyance.
Esperance	Supply to shipping ...	Well, pump, windmill, piping, etc. ...	8,000	Completed.
Guildford	Domestic supply	Reticulation from artesian bore ...	...	Plans and estimates prepared and handed to Municipal Council.

Digitized by Google

6.—ROYAL MINT.

(PERTH BRANCH.)

(Information supplied by J. F. Campbell, Esq., Deputy Master.)

Early in 1894 an application was made by the Government of Western Australia to the Home Government for the establishment of a branch of Her Majesty's Mint at Perth. The assent of the Lords of the Treasury and of the Secretary of State for the Colonies having been obtained, the Parliament of Western Australia passed an Act entitled "The Perth Mint Act, 1895," by which "there shall be payable to Her Majesty in every year out of the Consolidated Revenue Fund of Western Australia a sum or sums not exceeding in the whole in any year the sum of ten thousand pounds, for defraying the salaries, contingencies, retiring and other allowances and expenses connected with the establishment of the Perth Branch of the Royal Mint," and "all sums by way of fees, dues, or charges lawfully received or collected at the Perth Branch shall be from time to time accounted for and paid over by the Deputy Master . . . . to the Colonial Treasurer, to be paid by him into the Consolidated Revenue Fund of the Colony."

To meet the cost of treating the increased output of gold, the Mint annuity was subsequently raised to £20,000 a year (Perth Mint Act, of 2nd August, 1899).

On the 13th October, 1897, Her Majesty the late Queen passed an Order-in-Council, approving a draft proclamation establishing a branch Mint at Perth. This proclamation was published in the *London Gazette* on the 15th October, 1897, and was promulgated in Western Australia on the 13th July, 1898. It ordains, among other things, that "The gold coins coined . . . . at the branch Mint at Perth shall be deemed to have been issued from our Mint, and shall be current and a legal tender in like manner, and to the like extent as if they had been coined and issued in England."

The necessity for having a branch of the Royal Mint, and not a local institution, is due to the fact that coinage is one of the prerogatives of the Crown, and can only be conducted in the British dominions by officers under the direct control of the Lords Commissioners of His Majesty's Treasury. The Mint buildings are colonial property, but the Mint as an institution for the conversion of bullion into coin is in every sense a department of the Imperial Government. When the application for the establishment of the branch Mint was made, the production of gold in Western Australia was in its infancy, and it was expected that the out-turn of the precious metal would reach a total of £1,000,000 during the then current year, 1894, an expectation which was not fully realised, the value of the metal produced being about

Digitized by Google

£880,000 only. Since that time, however, the output of gold has been increasing rapidly; that for the year 1900 amounted to a little more than £6,000,000.

The main object in view in having a Mint established in the Colony was to provide a market where the miner would be able to dispose of his gold at the sterling value of the metal (£3 17s. 10½d. per ounce of gold $\frac{11}{12}$ths fine) and would obtain that value after the delay of only a few days, instead of having to make the best bargain he could with his bank or with a private dealer. Prior to the opening of the Mint a miner, who did not care to accept a rough-and-ready valuation of the metal he had won, was compelled to either arrange for it to be sent to one of the existing Mints in Australia, or to some firm of refiners in London or elsewhere. Either alternative involved delay and considerable expense in freight, loss of interest, etc.

The opening of the Mint has therefore directly benefited the mining industry and indirectly the State as a whole. When considering the value of the Mint to the State it must not be lost sight of that the form into which most of the metal is converted is one which has advantages over any other shape in which gold can be commercially dealt with. Ingots, except when they bear a Government stamp, as in the case of those issued by the Australian Mints for use in India, and those made at the Mints of the United States, are not saleable without being assayed and re-assayed almost every time they change hands. The sovereign, however, is not only the standard of value and the chief current coin of the United Kingdom and of most of the British colonies, but is accepted as bullion throughout the world without question as to fineness.

The Mint was opened by His Excellency Sir Gerard Smith, the then Governor of the Colony, on the 21st June, 1899. The Receipts and Issues from that date to the 31st December, 1901, were as follow:—

Period.	Receipts.	Issues.	
		Coin.	Bullion.
	ozs.	£	£
1899 (21st June to Dec.)	209,409·70	690,992	3
1900	581,200·40	1,945,777	29
1901	860,372·94	2,889,333	21,225
21st June, 1899, to 31st Dec., 1901	1,650,983·04	5,526,102	21,257
		£5,547,359	

Digitized by Google

7.—THE WESTERN AUSTRALIAN MUSEUM AND ART GALLERY.

(Information supplied by Bernard H. Woodward, Esq., F.G.S., etc., Director.)

The Museum is situated about 250 yards North of the Perth Central Railway Station, at the corner of James and Beaufort Streets. The entrance is from Beaufort Street.

As its name implies, it is essentially a Western Australian Museum, the collections already containing specimens of the greater number of the indigenous mammals and birds, as well as many of the reptiles, fish, etc. Full particulars of these will be found in the chapters on "Fauna," and of the timbers and plants under "Forestry" and "Flora."

In the year 1860 a number of the residents of this State resolved to establish a Museum, and for that purpose opened a subscription list, obtaining altogether the then large sum of £340 19s. 11d., for it must be borne in mind that 40 years ago the population (15,227) was small, scattered, and far from wealthy. The list, however, was a long one, showing how general was the interest taken in the movement.

To the then Surveyor-General, Captain John Septimus Roe, R.M., who died in 1878, at the age of 81 years, must be accorded the chief credit for the work, for he, in addition to subscribing, gave valuable collections, and devoted much time to their arrangement.

The Museum thus formed was attached to the Swan River Mechanics' Institute until 1892, when the Government purchased the collection for £400, so that it might be incorporated with others. In 1881, the Rev. C. G. Nicolay had, at the suggestion and with the help of the late Sir W. C. F. Robinson, established a Geological Museum in the Old Guard Room at Fremantle, where he arranged and added largely to the geological collections made by Dr. F. Von Sommer; by Messrs. Gregory Bros.; by Mr. H. Y. L. Brown, F.G.S. (now Government Geologist of South Australia); and by the late Mr. E. T. Hardman, F.R.G.S.I., Government Geologist of Western Australia in 1882-3. The collection in the Fremantle Museum was, in 1889, transferred to the charge of Mr. Harry P. Woodward, F.G.S., then Government Geologist, and was removed to Perth and placed in the room formerly used as the High Court of Justice (now the Ethnological Gallery), Mr. Bernard H. Woodward, F.G.S., being appointed Curator of the Geological Museum. This title was, in 1892, abbreviated by the omission of the word "Geological," when, as before mentioned, the Government purchased the Museum of the Swan River Mechanics' Institute, as the collection then obtained included Zoological, Botanical, and Ethnological, as well as Geological, specimens.

In the same year, the late Colonel Phillips, then Commissioner of Police, deposited in the Museum the valuable collection of native weapons and implements that had been gradually got together by his department.

Digitized by Google

In 1895 the control of the Museum was transferred from the Hon. the Minister of Mines to a committee nominated by the Government, consisting of the following gentlemen:—The Honourable Sir James G. Lee Steere, Chairman; His Honour Mr. Justice Stone, the Honourable Sir George Shenton, the Honourable J. W. Hackett, M.A., Messrs. M. F. A. Canning, Chas. Harper, His Honour Mr. Justice James, B.A., and Dr. Harvey. Two additional galleries were then added, one for zoology, opened by His Excellency the Administrator, Sir A. C. Onslow, on the 31st July, 1895, and the other for Art, the latter of which was not opened until the following year. The Government then increased the annual grant from £200 to £4,000 per annum, at which amount it remained until 1898-99.

In 1897 Parliament agreed to the erection of further buildings, and a substantial stone edifice of two stories, containing two galleries, 132ft. by 38ft., with offices and store rooms in the basement, was erected at a cost of £20,000. The ground floor and basement have been temporarily lent to the Victoria Public Library until its own building shall be erected, for which purpose Parliament, in 1900, voted the necessary money, as also at the same time that for the building of an Art Gallery, which is to comprise two floors 150ft. long. The foundation stone of this wing was laid by H.R.H. the Duke of Cornwall and York on the 25th July, 1901, but nothing further has, as yet, been done, although the galleries are urgently needed. At the present time the various collections of objects of Art, of Ethnology, and of Natural History have had to be arranged in the manner best suited to their display in the limited space available, rather than in strict accordance with scientific order.

The collections in this Museum are arranged in three sections, viz., Art, Ethnology, and Natural History.

Section I. (*Art*).—Architecture, Sculpture, and Painting.

Section II. (*Ethnology*).—The study of the history of man, or more fully of the rise and progress of civilisation, as exemplified by the works of man.

Section III. (*Natural History*).—This term is used to describe all the processes or laws of the Universe, and the results of those processes or laws upon the materials of which it is composed, which are independent of the agency of man.

Art Section.—During the past year many important additions have been made, notably in the oil paintings, namely, works by Creswick, Karl Heffner, and Scherrewitz; and in the sub-section of "Arts and Crafts," of Hammered Iron, by Nelson Dawson and Starkie Gardner; Cloissoné Enamels, by Edith Dawson; Beaten Silver, by Liberty; China, from Cauldon; Pottery, from the Della Robbia Factory, Meissen, Ceylon, etc.; Glass, from Venice and Bohemia.

Ethnology.—The collection of Western Australian Implements and Weapons has been largely increased, and many specimens added to the general collection.

Digitized by Google

The Early History of Western Australia is illustrated by numerous relics, the most interesting of which are those of the Dutch vessel "Zeewyk," wrecked on the Abrolhos in 1727. They were unearthed most carefully by Messrs. Broadhurst, McNeil & Co., and it is through their courtesy that this Museum has been enriched by these valuable additions.

Natural History.—Reference to the Mammals and Birds has already been made. Of forms not found in Australia, all the most important orders are now represented.

A most valuable "index" case has been added to the Mollusca. It contains sections of shells with all the parts named, so that students can easily comprehend the various technical terms used in text books.

The Paleontological collections contain the historical collection of 3,400 fossils made by the late Professor Tennant; of these the vertebrates were named by the late Mr. Wm. Davies, F.G.S., and the invertebrates by the late Dr. S. P. Woodward, F.G.S., both of the British Museum. This collection had been in the Geological Department of the British Museum for some years, as its purchase was contemplated by that institution because it contains so many "type" specimens.

The chief interest, however, of most visitors to the State centres in the rich gold specimens from the Coolgardie, Yilgarn, Murchison, Pilbara, Roebourne, Kimberley, and other goldfields. These have nearly all been presented by directors of mines or by residents in the State.

As a matter of convenience the rock specimens of the State are arranged geographically, while the minerals are arranged as follows:—Metallic ores, gold, tin, copper, antimony, zinc, lead, iron, plumbago (black lead), earthy minerals, asbestos, mica, etc., as being the best for practical purposes, while the Woodwardian collection of ores and minerals from all parts of the world is arranged on the chemico-crystallographic system adopted in the British Museum.

The Herbarium has been re-arranged, and all the plants remounted. The donations of Dr. Diehl and Mr. W. D. Campbell have been very large and interesting.

The Museum is open to the public from 10 a.m. to 5 p.m. every week day except Friday, and on Sunday afternoons from 2·30 to 5. Friday is reserved for cleaning in the morning, and for students (permission to be obtained from the Director) who desire to copy the works of art, or make drawings of the Natural History specimens, a privilege which is much appreciated.

The average attendance of visitors is about 4,000 per month. That on Sundays varies from 300 to 600.

Digitized by Google

8.—VICTORIA PUBLIC LIBRARY OF WESTERN AUSTRALIA.

[Founded 1887.]

(Compiled by Jas. S. Battye, B.A., LL.B., Librarian.)

The Estimates for 1887, laid before the Legislative Council in 1886, contained provision for the sum of £5,000 to be expended on the celebrations in Western Australia of Her Majesty's Jubilee. As no decision was arrived at in the Council regarding the objects to which this money should be devoted, a Commission was appointed, consisting of members of the Council and other gentlemen, with the then Governor, Sir Frederick Napier Broome, as chairman, to draw up a scheme for the erection of a fitting memorial in honour of the event. The Commission met on the 21st December, 1886, and various propositions were made, but ultimately it was decided that £2,000 of the amount should serve as Western Australia's donation towards the Imperial Institute, and the balance should be devoted to the foundation of a Free Public Library to be established in Perth.

A committee was then appointed by His Excellency the Governor to have charge of the arrangements in connection with the choice of a site, preparation of plans, and the foundations of the institute; and they, in their report to the Legislative Council, recommended that the site of the old Government Boys' School would be the most suitable on which to build the library; but owing to the scarcity of funds they suggested that the foundations only of the building be laid, and that the premises lately used by the Western Australian Bank should be leased, and books to the value of £1,000 be ordered from England and placed therein to serve as a temporary library, pending the completion of the structure.

The recommendations of the committee were, in the main, adopted, and on the 21st June, 1887, the foundation-stone of the institute was laid by His Excellency the Governor, in the presence of representatives of all the public bodies of the Colony. The Victoria Public Library Bill was placed before the Legislative Council soon afterwards, but, although it was passed through all stages, it ultimately failed to become law.

A committee of management, consisting of Sir Malcolm Fraser, K.C.M.G. (chairman); Septimus Burt, Esq., Q.C.; J. W. Hackett, Esq., M.A.; M. F. A. Canning, Esq., and F. J. Hickling, Esq., was appointed in May, 1888; and on the 26th January, 1889, the library was opened with 1,796 volumes on the shelves. Mr. W. C. Townsend was appointed clerk to the committee, he being succeeded in

Digitized by Google

March, 1890, by Mr. Basil Porter, who held the position until 1894, when he resigned owing to loss of eyesight, and the present librarian was appointed.

In May, 1896, the original site being considered unsuitable, a commencement was made with the building in James Street, which the Library now temporarily occupies; the foundation-stone previously laid in St. George's Terrace was removed to its new position, a further stone commemorative of the Diamond Jubilee of Her late Majesty being placed with it, and the two were unveiled by His Excellency the Governor, Sir Gerard Smith, on the 22nd June, 1897, the function forming part of the celebration in Western Australia of the completion of the sixtieth year of Her late Majesty's reign. In August, 1897, the Library was moved from the old premises of the Western Australian Bank in St. George's Terrace into the basement, and twelve months later to the ground floor of the building now used.

The following tables will show the growth of the Institution:—

Year.	Volumes on Shelves.	Increase during Year.
1893-4	5,728	—
1894-5	8,300	2,572
1895-6	13,035	4,735
1896-7	16,245	3,210
1897-8	23,500	7,255
1898-9	33,612	10,112
1899-1900	38,728	5,116
1900-1	43,940	5,212

Year.	Visitors.
1892-3	23,714
1893-4	29,154
1894-5	35,395
1895-6	41,767
1896-7	56,523
1897-8	69,574
1898-9	106,339
1899-1900	82,414
1900-1	121,253

Digitized by Google

Classification of Books in Library on 30th June, 1901.

Subject.	Volumes.
Theology	2,678
Philosophy	592
Literature	10,542
History	6,921
Biography	2,265
Science	3,706
Arts and Trades ...	5,500
Social Science	11,005
Newspapers	731
Total	43,940

NOTE.—This total does not include Pamphlets and Parts, of which the Library at present contains about 8,000.

9.—THE OBSERVATORY.

(By W. E. Cooke, Government Astronomer.)

Towards the close of 1875 the Hon. Sir Malcolm Fraser, K.C.M.G., then Surveyor General, established a meteorological station, fitted with first-class instruments, in connection with his department and under his own personal supervision. Since then, as opportunity offered, various second-class stations have been added, equipped with the following instruments:—Mercurial barometer, dry and wet bulb, and maximum and minimum thermometers, wind vane, and 8-inch rain gauge; and, in addition, rain gauges have been freely distributed to reliable observers throughout the State.

In 1896 the building of an Astronomical Observatory was commenced on Mt. Eliza, a hill overlooking the city, and the Meteorological Department was transferred to the Government Astronomer. Many fresh stations have been equipped, and every observer is visited occasionally, an inspection being made at least once a year to every station South of the tropics, except a few outlying ones in the extreme South-East, which are very difficult to reach. There are now 35 stations of the second order, nine stations equipped with maximum and minimum thermometer and Stevenson's Screen, in addition to the rain gauge (these are called

Digitized by Google

climatological stations, and it is proposed to increase their number as rapidly as circumstances permit), and 295 furnished with rain gauges only.

The equipment of the Perth Observatory is as follows:—

Astronomical.—Astrographic equatorial of 13 inches aperture, with a 10-inch visual, by Sir Howard Grubb; 6-inch transit circle, by Troughton and Simms; coelostat, and 8½-inch reflecting telescope; spectroscope; chronograph, fitted with Grubb's control; sidereal and mean time clocks and chronometers, etc. The transit room is of a new pattern, designed by Sir David Gill, Astronomer Royal at the Cape of Good Hope, and constructed by Sir Howard Grubb.

Meteorological.—Barograph (Redier); thermograph (Richards); sunshine recorder; set of platinum resistance thermometers; standard barometer; standard thermometer; dry and wet bulb thermometers; maximum and minimum dry and wet self-registering thermometers; solar radiation self-registering thermometer; anemograph; evaporation tank; pluviometer; evaporimeter; rain gauge (Todd's), eight inches in diameter; ozone cage (Sir James Clarke's); Negretti and Zambra's papers, and scale of tints; seismograph (Milne's pattern).

The hours of observation for record purposes are 9 a.m. and 3 p.m. These are two of the hours adopted by the Intercolonial Meteorological Conference of 1881.

The barometers used are in all cases mercurial, and the readings are corrected for index error, temperature, and mean sea level.

In astronomy the main work consists of this State's contribution to the International Photographic Durchmusterung. The zone of the sky allotted to Perth lies between the parallels of 32deg. and 40deg. South declination. The astrograph is used for obtaining two series of photographs, each plate covering a celestial area of 2deg. square.

For the first series three exposures of six minutes, three minutes, and 20 seconds respectively are given on the same plate, the telescope being moved very slightly in declination between successive impressions.

The positions of all the stars which give satisfactory images are measured and will be published. This publication, in conjunction with a similar one to be issued by 17 other co-operating observatories, will contain the positions, reduced to the 1st of January, 1900, of all objects in the sky as bright as a star of the 11th magnitude. The second series of plates receive three exposures of half an hour a-piece, the telescope being slightly moved between successive impressions, so that the image of each star, when closely examined, consists of three dots forming the points of an equilateral *triangle. These plates* will not be measured,

Digitized by Google

hoped that they may in time be printed in an enlarged form for distribution. The positions obtainable from these photographs will of course be only relative, and in order to make them absolute it is necessary to observe a few in each area, and obtain their positions by means of the transit circle. For this purpose three stars of a magnitude not less than the ninth are selected, in each degree square, and the right ascensions and the declinations of these standard stars are being obtained by observations with the transit circle.

This represents the main astronomical work of the Observatory.

In addition, a very practical feature is the maintenance of correct time, which, prior to the establishment of the Observatory, was an unknown quantity. The standard clock is regulated to keep true time of the 120th meridian (eight hours ahead of Greenwich), and by means of electric currents performs the following functions:—

(1.) It drops a time ball at 1h. daily at Fremantle, and at such other hours as may be asked for by commanders of mail steamers.

(2.) It drops a time ball in Hay Street, not far from the Town Hall Clock, which now keeps good time.

(3.) It controls a public clock at the front gates of the Observatory, immediately opposite the gates of the King's Park.

(4.) It controls a parent clock at the Principal Railway Station, Perth, whence signals are transmitted once a day throughout the Railway Department of the State.

(5.) It controls two clocks in the Telegraph Operating room, Perth, whence signals are daily transmitted to every Telegraph Station throughout the State.

The admission of visitors to inspect the instruments and view such of the Heavenly bodies as were favourably situated for observation, has in the past been quite a feature of the work, but facilities are now of necessity somewhat restricted. Three evenings per month are still reserved for this purpose, previous application in writing to the Government Astronomer being required; and on every Tuesday afternoon the grounds are opened to the public and an assistant is ready to show and explain the uses of the various instruments.

The Meteorological work consists in the maintenance and occasional extension of the system of observations already established, every means being taken to ensure the accuracy of the records. Readings of barometer, thermometers, wind, rain, weather, and state of the sea are telegraphed daily not only from all the stations in this State, but from a selected number in the other States, and from these a general weather report, a special rainfall report, an isobar map, and a forecast of the probable weather for the next 24 hours are prepared. These are all exhibited at several places in both Perth and Fremantle, and the forecast is in addition telegraphed

Digitized by Google

to several seaside stations. A copy of the map and forecast is also presented to the commander of any mail boat which may happen to be in Fremantle at the time of issue.

A number of stations in this State also telegraph readings at 6 p.m., and from these a supplementary report is prepared and contributed to the daily papers for the next morning's issue.

The forecasts on the whole have been so correct and popular that several places have asked for special ones to be prepared, and at present the following are distributed daily :—

(1.) General forecast for the whole State, issued at noon, exhibited at many public places in Perth and Fremantle, and telegraphed to several seaside towns.

(2.) Special forecast for the Coolgardie Goldfields, wired at noon, and published in the Boulder Evening Press.

(3.) Special forecast for the Murchison Goldfields, wired daily at noon, and publicly exhibited at the Cue Post Office.

(4.) General forecast for the whole State, issued at 8 p.m., to cover the weather for the following day, published in the Perth daily papers.

(5.) Special forecast for the next day for the Coolgardie Goldfields, wired at 8 p.m. to the daily press at Southern Cross, Coolgardie, Kalgoorlie, Menzies, and Kanowna.

(6.) Special forecast for Perth and its immediate neighbourhood only, telephoned daily at 9 a.m. and exhibited, in conjunction with a pictorial illustration, in the vicinity of the Town Hall, in Hay Street.

10.—THE ZOOLOGICAL AND ACCLIMATISATION GARDENS.

(Particulars supplied by the Director, Zoological Gardens.)

The Zoological Gardens are located in South Perth. The grounds, comprising 42 acres, have been cleared, fenced, and laid out suitably for the proper reception of a large and varied collection of animals and birds. Amongst the animals bred in the Gardens since their establishment may be mentioned tigers, leopards, dingoes, buffalo, various cattle, deer, wild swine, whilst many less important animals have also proved prolific. Many birds have also been bred, including ostriches and emus. An excellent supply of artesian water was struck in the gardens on 27th February, 1899, at a depth of 1,860ft. The flow is estimated at 350,000 gallons per day, and as the water is warm, being 103deg. at the bore mouth, it is very *suitable for keeping* up the temperature of reptile and

Digitized by Google

houses that require artificial heat. The management of the Gardens is vested in the Acclimatisation Committee, of whom the Hon. J. W. Hackett is chairman. The Director of the Gardens is Mr. E. A. Le Souëf. The Gardens were opened to the public on 17th October, 1898, and to the end of the year 1901 no less than 176,812 people paid for admission.

II.—THE KING'S PARK.

(Particulars supplied by the Secretary, King's Park Board.)

The King's Park, on Mt. Eliza (the old native name of which was Gargatup), commands an extremely fine panoramic view of Perth, its surroundings, and the lovely stretches of the Swan River. It contains upwards of 1,000 acres. Everything has been done to preserve the native trees and flora, so that the wild flowers and shrubs are a delightful feature of the Park. The first non-indigenous tree—a Norfolk Island Pine—was planted by Sir John Forrest, opposite the principal pavilion, in August, 1895. In August, 1897, the main drive from the Havelock Street entrance to Crawley, a distance of nearly three miles, was completed and opened. This practically constituted the opening of the Park to the public.

A Board, at present consisting of the Rt. Hon. Sir John Forrest, M.H.R., President; the Hon. Dr. J. W. Hackett, M.L.C., Vice-President; the Hon. Sir George Shenton, M.L.C.; the Hon. B. C. Wood, M.L.C.; G. T. Poole, Esq.; A. Lovekin, Esq.; H. Daglish, Esq., M.L.A.; and the Mayor of Perth *ex officio*, was appointed in August, 1896, and under its control a vast amount of work in improving and beautifying the Park has been accomplished. Three miles of pathway have been constructed, and many hundreds of trees and shrubs are planted and growing well.

The "May" drive, a distance of three miles, completed in July, 1901, was opened by H.R.H. the Duke of York, during the Royal visit to the State. This is a particularly fine roadway, opening up the central portions of the Park. On commanding positions, over-looking the river, are two fine pavilions; a charming tea room on the terraces below the cliff, one of the most attractive spots in the Park, and a very pretty and ornamental lodge at the main entrance, have also been erected.

The King's Park may be reached by tram through Colin Street, and, on the Subiaco side, by Rokeby Road. It is open daily from sunrise to 10 p.m.

By Authority: Wm. Alfred Watson, Government Printer, Perth.

Digitized by Google

Digitized by Google

Digitized by Google

WESTERN AUSTRALIAN YEAR-BOOK

FOR

1900-03

(Being the Second Volume of the Year-Book for 1900-03, with complete information and Statistics to the end of 1903.)

TWELFTH EDITION.

BY

MALCOLM A. C. FRASER,

F.R.G.S.; F.S.S.; F.R.C. Inst.,

GOVERNMENT STATISTICIAN AND REGISTRAR GENERAL
OF WESTERN AUSTRALIA.

IN TWO VOLUMES.

VOLUME II.

(The present volume, together with the Year-Book for 1900-0
Volume I., forms the complete 12th Edition of the
Western Australian Year-Book.)

PERTH:

BY AUTHORITY: WM. ALFRED WATSON, GOVERNM

1904.

Stanf
OCT 23 1904
Library

Digitized by Google

Digitized by Google

INTRODUCTION.

The extreme lateness of the appearance of the present volume, which, together with Volume I. of the "Year-Book for 1900-01," forms the complete 12th edition of the Western Australian Year-Book, is, I regret to say, primarily due to the vexatious and unnecessary delays experienced in obtaining the requisite information from some of the official departments, whose ready and cordial co-operation, it will be at once recognised, is absolutely essential to the prompt publication of a work of this nature; and in the second instance to the unexpected heavy pressure of work which has recently occurred in the Government Printing Department. The delay has, however, been taken advantage of to bring the book well up to date, and, wherever possible, information to the end of 1903 has either been included in the text, or, if not there, added in the "Appendices." The adoption of this course has consequently enabled me to make the volume, notwithstanding its title, a well up-to-date publication.

A feature of especial interest noticeable in this issue is the inclusion of the "Budget Speech" for 1903-1904, reprinted as an appendix, vividly depicting, as it does, the views of the existing Government on the past, present, and future progress and prosperity of the State.

The results of the Census of 1901 are fully dealt with in the chapter on "Population and Vital Statistics," and to this chapter is appended a "Western Australian Life Table" by Mr. C. H. Wickens, A.I.A., the Actuary of the Statistical Department, a compilation which is, I understand, the first one of its kind ever published in this State.

To the Commissioner of Railways I am indebted for a comprehensive and most valuable article on the "Government Railways," the Government Geologist has kindly contributed an instructive scientific chapter on "Mineral Production," I have to thank the Acting Director of Agriculture for a most useful contribution on the agricultural and pastoral industry and capabilities of the State, and my thanks are also due to various other Heads of Departments for the valuable items kindly supplied by them; whilst

as regards contributions from outside sources I most gratefully acknowledge two extremely interesting chapters by Mrs. Daisy E. Bates on "The Possibilities of Tropical Agriculture in the North West," and on "Stock Routes."

In conclusion, I have to express my warmest thanks to Mr. W. Siebenhaar for the manner in which he has assisted me throughout this work. A book of this nature is not one which can be compiled haphazard, and to Mr. Siebenhaar's unremitting care and attention any credit that may attach to it as an official work of reference is undoubtedly due.

MALCOLM A. C. FRASER,

Government Statistician and Registrar General.

11th March, 1904.

Digitized by Google

VOLUME II.

CONTENTS.

SUBJECT.	PAGE
STATISTICAL SUMMARY of Western Australia from 1829 to 1902 ...	viii.
PART I.—POPULATION AND VITAL STATISTICS—	
1.—Population	1
2.—Immigration and Emigration	8
3.—Naturalisation	11
4.—The Census of 1901	12
5.—Vital Statistics	29
6.—Western Australian Life Table	64
PART II.—INTERCHANGE—	
1.—Imports and Exports	74
2.—Shipping	94
3.—Bonding Warehouses	103
4.—Railways and Tramways	104
5.—Postal Service	151
6.—Telegraphs	158
7.—Telephones	163
PART III.—LAND—	
1.—Crown Lands	165
2.—Agricultural Bank	182
3.—Land Titles	185
PART IV.—INDUSTRIES—	
1.—Agricultural	187
2.—Pastoral	223
3.—Mining	232
4.—The Timber Trade	298
5.—Fisheries	301
6.—*Factories and Industrial Establishments*	

Digitized by Google

SUBJECT. PAGE

PART V.—FINANCE—

1.—Public Finance 34
I.—Consolidated Revenue Fund 35
II.—General Loan Fund 35
III.—Sinking Funds... 35
IV.—Trust Funds 35
2.—Private Finance 35
(a.) Banks of Issue... 35
(b.) Post Office Savings Bank 35
(c.) Insurance 35
I.—Life Assurance 35
II.—Fire Insurance 36
III.—Marine Insurance 36
IV.—Accident Insurance... 36

PART VI.—SOCIAL—

1.—Education 36
2.—Religion 37
3.—Industrial Legislation... 38
4.—Friendly Societies and Building Societies 38
5.—Associations, Halls, and Institutes 38
6.—Charitable Institutions, etc. 39
7.—Law and Crime 397
8.—Wages and Prices 428
9.—Newspapers 435
10.—Public Holidays 437

PART VII.—MISCELLANEOUS—

1.—Shipping Facilities 437
2.—Emigration to Western Australia 457
3.—Consuls of Foreign Countries 460

APPENDICES—

A.—Statistics of Western Australia 461
B.—Australasian Statistics 519
C.—Financial Statement for the year 1903-1904 553

ALPHABETICAL INDEX 593

Digitized by Google

LIST OF MAPS AND DIAGRAMS.

		Page
1.	General Map of the State (Frontispiece)	
2.	Population	6
3.	Immigration and Emigration	8
4.	Births, Deaths, and Marriages	28
5.	Imports, Exports, and Total Trade	78
6.	Principal Exports	84
7.	Customs Revenue and Shipping	92
8.	Railway Map	104
9.	Geological Map of Coolgardie	251
10.	Topographical Map of Kalgoorlie	254
11.	Geological Map of Northampton	270
12.	Geological Map of Greenbushes	272
13.	Geological Map of the Collie Coalfield	278
14.	Geological Map of the Irwin Coalfield	279
15.	Mineral Map of Western Australia	280
16.	Annual Gold Production of Western Australia	286
17.	Gold Yield of Australasia	294
18.	Gold Yield of Principal Countries	295
19.	Revenue, Expenditure, and Public Debt	322

Digitized by Google

ERRATA.

VOL. I.—Page 273, 18th line, omit the following words: "Finches and Doves (16th April, 1902)," and between the 36th and 37th lines, *read*: "For Finches and Doves (13th August, 1902) within the Kimberley Division, from 1st August to 30th November, both inclusive."

VOL. II.—Page 80, 4th line, for "£13,500,000" *read* "13,500,000lbs."

VOL. II.—Page 83, under "Total Imports" for 1901, for "£5,454,171" *read* £6,454,171."

VOL. II.—Page 159, 21st and 22nd lines, omit "and the expenses have since been defrayed from the Consolidated Revenue."

VOL. II.—Page 160, last line, for "12,896" *read* "12,296."

Digitized by Google

Digitized by Google

Digitized by Google

WESTERN AUSTRALIAN YEAR-BOOK

FOR

1900-1901.

VOLUME II.

PART 1.—POPULATION AND VITAL STATISTICS.*

1.—POPULATION.

The number of the population is used as a basis in nearly all statistical investigations concerning any country, and a knowledge of it is therefore indispensable to the proper consideration of many questions—political, social, and economical. It is thus of the utmost importance that it should be ascertained with the greatest attainable accuracy, and consequently, in all civilised communities an exact enumeration of the population is made regularly—usually at intervals of ten years. A proposal to take a census of all civilised countries on 31st December, 1900, the last day in the nineteenth century, was under discussion at the meeting of the International Statistical Institute held at St. Petersburg in August, 1897, but from the replies that had been received from the various authorities it was found to be impracticable.

The system followed in England since 1801 has been to take a census on the night of the first Sunday in April, in the first year of each decade, a slight variation, however, being made in the case of the last census, which was taken for the night of Sunday, 31st March, 1901. This course has also been latterly adopted throughout the Australian States, and the Colony of New Zealand; the last mentioned taking an additional Census in the sixth year of each decade.

The Conference of Statisticians which met in Hobart in January, 1902, after long discussion and careful consideration, unanimously passed the following resolution:—

> "That owing to the difficulty of estimating the number of the "people at long intervals, it is desirable to take an inter-"mediate Census—five years after each general Census—"showing at least the names, sexes, and ages of the people, "and distinguishing Chinese and the coloured races, so "that it may be possible to separate them from the general "population, if thought desirable."

* For figures relating to 1902, *see* "Statistical Appendix."

Digitized by Google

Up to the present, however, no further action has been taken in the matter, although the information to be obtained by the adoption of the suggestion would undoubtedly prove of inestimable value to the Commonwealth and State Executives, for financial, political, social, educational, and, if necessary, military purposes.

The disturbing influences of both external and internal migration, resulting from the present increased facilities both of sea and land travel, which cause a constant interchange of population between the various States of the Commonwealth, and also between the various districts of each State, such, for instance, as that brought about in this State by the rushes to new gold discoveries, the undertaking of great engineering or other public works, and the opening up of large new industries like the timber and coal trades, etc., supply cogent reasons, which used not to exist in years gone by, for the immediate establishment of a quinquennial Census.

The importance of possessing an approximately accurate record of the population of the Commonwealth, and of its distribution throughout the six Federal States, cannot be too strongly urged, when it is taken into consideration that nearly every provision made for the welfare of the Commonwealth, for the administration of the departments under its control, and for the representation of the individual States in the Federal Legislature, either is at present, or probably eventually will be, arranged for, as far as possible, on a population basis, whilst for State purposes a knowledge of the constitution of its population and its distribution over the various portions of the country, is absolutely indispensable to the Executive for the proper performance of all internal administration.

Undoubtedly the most accurate results would be obtained by reducing the interval between the Censuses as much as possible, but it is very generally agreed that a period of five years would be sufficiently short for all practical purposes.

The date on which each Census has been taken in Western Australia, and the population then returned, will be seen in the following table :—

Date of Census.	Length of intercensal period.		Population.			Increase during period.		
			Males.	Females.	Total.	Numerical.	Per cent.	Per cent per annum.
	years	days						
October 10, 1848 ..	..	..	2,818	1,804	4,622	..	..	..
September 30, 1854	5	355	7,779	3,964	11,743	7,121	154·07	16·90
December 31, 1859	5	92	9,522	5,315	14,837	3,094	26·35	4·55
March 31, 1870 ..	10	90	15,375	9,410	24,785	9,948	67·05	5·14
April 3, 1881 ..	11	3	17,062	12,646	29,708	4,923	19·86	1·66
April 5, 1891 ..	10	2	29,807	19,975	49,782	20,074	67·57	5·39
March 31, 1901 ..	9	360	112,875	71,249	184,124	134,342	269·86	13·99

For intercensal years, recourse must be had to estimates, and various methods are adopted in making these. The method employed by the Registrar General in England is to assume that the *rate* of in-

Digitized by Google

crease shown to have been in force during the previous census period will operate during the current one, and from this, on the basis of the result of the last census, to calculate the estimated population for each year. Another method, which is in use in one at least of the United States of America, is to assume that the numerical increase during the current census period will be equal to the numerical increase for the preceding one, and to distribute that increase uniformly over the period. In other words, the former method assumes that the population is increasing in geometrical progression, and the latter that it is increasing in arithmetical progression. Neither of these methods is employed in Australia, where an endeavour is made to ascertain the exact population at any required date by means of statistics of births, deaths, immigration, and emigration. If these statistics were perfectly reliable, it is evident that the true population would be found by adding to the population shown at the last census the number of births and arrivals that have occurred since, and deducting the number of deaths and departures. The registration of births and deaths is, in most cases, fairly complete, but the records of arrivals and departures by sea are hardly so satisfactory, although very great improvement has been made in them of late in this State, owing to the cordial assistance which has been rendered to the Statistical Department in this matter by the various shipping offices represented here. There are also, doubtless, inaccuracies due to unrecorded migrations by land. In the case of Western Australia, however, since practically all external migration is by sea, this latter has little, if any, appreciable effect.

In order to allow for the tendency to over-estimate the population, it is the practice in several of the States of Australia to make, during each intercensal period, an adjustment of the migration figures, which usually takes the form of adding to the number of departures recorded a percentage based on the experience of the preceding intercensal period.

So far as the total population of Western Australia is concerned, although no adjustment for unrecorded departures had been made during the decennium, the result disclosed by the Census of 31st March, 1901, agreed very closely with that obtained for the same date by the ordinary method of estimating, the number actually enumerated being 184,124, as compared with the estimate of 184,537, an over-estimate of less than ¼ per cent. As regards the distribution according to sex, however, the results were not so satisfactory, the male population being found to have been over-estimated by no less than 6,896, and the females to have been under-estimated by 6,483. This error in sex distribution has probably arisen through the absence of indications as to sex on certain of the passenger lists, and the consequent inability to distinguish between males and females.

As soon as the final Census results had been ascertained, the figures for the intercensal period were subjected to revision, the adjustments made being based on the assumptions that the over-estimate in the total population was due to unrecorded departures,

Digitized by Google

and that the sex discrepancy was due to female arrivals and departures being recorded as male. The factors contributing to the increase of population during the decennium may be seen from the following statement :—

Particulars.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
							No.	No.	No.
Population on 5th April, 1891 (exclusive of full-blooded Aboriginals)							29,807	19,975	49,782
	No.	No.	No.	No.	No.	No.			
BIRTHS AND DEATHS:									
Births registered during the Decennium	17,224	16,448	33,672						
Deaths registered during the Decennium	12,132	5,639	17,771						
Increase by excess of births over Deaths				5,092	10,809	15,901			
IMMIGRATION AND EMIGRATION:									
Arrivals by sea during the Decennium	185,030	82,830	267,860						
Departures by sea during the Decennium	107,054	42,365	149,419						
Increase by excess of Arrivals over Departures				77,976	40,465	118,441			
Net increase of Population during the Decennium							83,068	51,274	134,342
POPULATION ON 31ST MARCH, 1901 (exclusive of full-blooded Aboriginals)							112,875	71,249	184,124

Digitized by Google

Similar information for the year ended 31st December, 1901, is as follows :—

Particulars.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
							No.	No.	No.
Estimated Population on 31st December, 1900 (exclusive of full-blooded Aboriginals) ..							109,923	69,785	179,708
	No.	No.	No.	No.	No.	No.			
BIRTHS AND DEATHS:									
Births registered during the year 1901	2,946	2,772	5,718						
Deaths registered during the year 1901	1,653	866	2,519						
Increase by excess of Births over Deaths				1,293	1,906	3,199			
IMMIGRATION AND EMIGRATION:									
Arrivals by sea during the year 1901	21,249	11,513	32,762						
Departures by sea during the year 1901	13,703	7,077	20,780						
Increase by excess of Arrivals over Departures				7,546	4,436	11,982			
Net increase of Population during the year 1901							8,839	6,342	15,181
ESTIMATED TOTAL POPULATION ON 31ST DECEMBER, 1901 (exclusive of full-blooded Aboriginals) ..							118,762	76,127	194,889

Digitized by Google

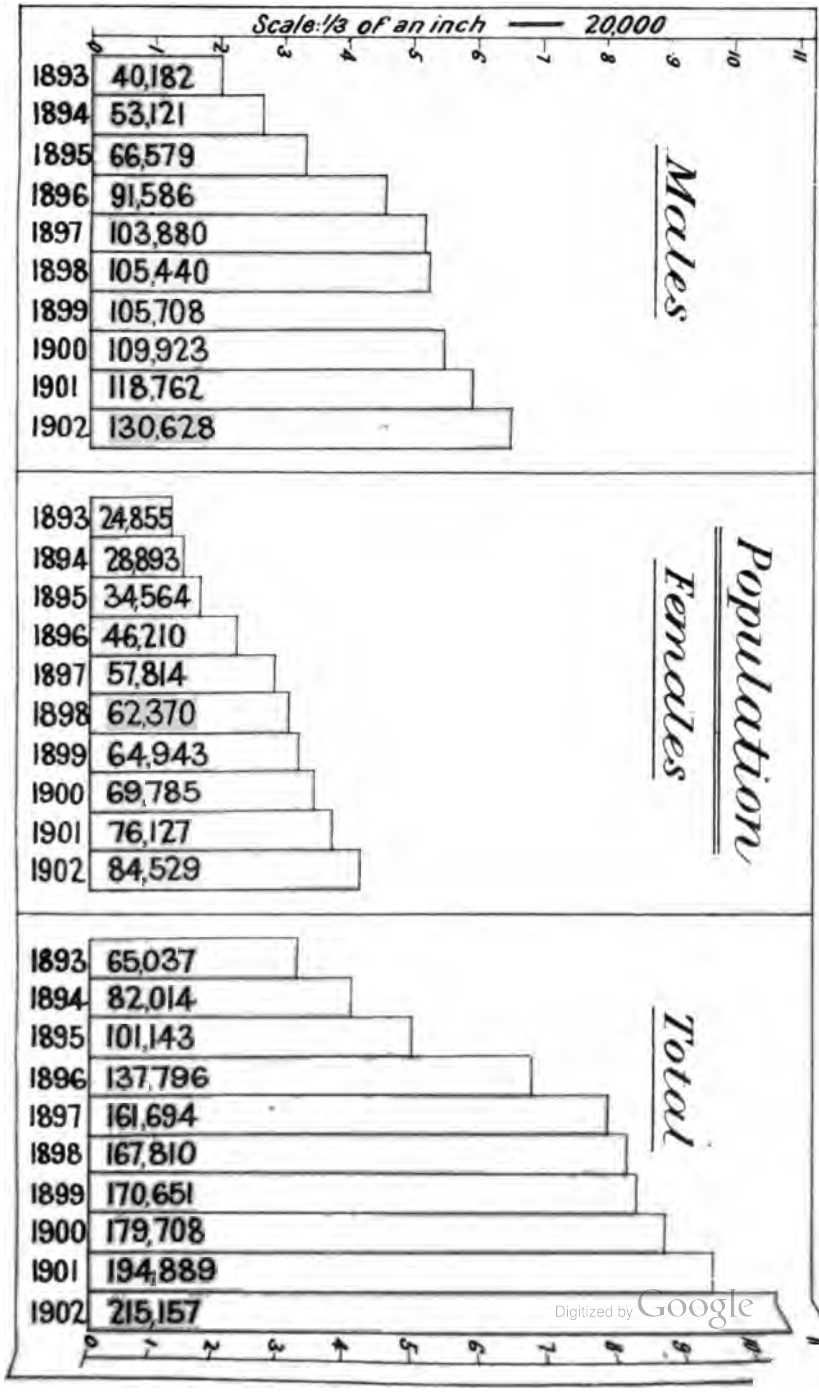
The population of Western Australia on 31st December, 1830. was estimated at 1,767, exclusive of aboriginals, and also exclusive of a detachment of troops and their families. The following table shows the increase since that date as ascertained by estimates and actual enumerations :—

Year.	Males.	Females.	Total.	Increase on preceding estimate.		Number of Females to 100 Males.
				Numerical.	Per cent.	
1830 ..	..	..	1,767			
1840 ..	1,434	877	2,311	544	30·79	61·16
1850 ..	3,576	2,310	5,886	3,575	154·69	64·60
1860 ..	9,529	5,698	15,227	9,341	158·70	59·80
1870 ..	15,474	9,610	25,084	9,857	64·73	62·10
1876 ..	16,166	11,155	27,321	2,237	8·92	69·00
1877 ..	16,326	11,512	27,838	517	1·86	70·51
1878 ..	16,409	11,757	28,166	328	1·18	71·64
1879 ..	16,628	12,040	28,668	502	1·78	72·41
1880 ..	16,559	12,460	29,019	351	1·22	75·25
1881 ..	17,216	12,797	30,013	994	3·43	74·33
1882 ..	17,551	13,215	30,766	753	2·51	75·29
1883 ..	18,005	13,695	31,700	934	3·04	76·06
1884 ..	18,623	14,335	32,958	1258	3·97	76·97
1885 ..	19,989	15,197	35,186	2,228	6·76	76·03
1886 ..	23,044	16,540	39,584	4,398	12·49	71·78
1887 ..	24,807	17,681	42,488	2,904	7·34	71·27
1888 ..	24,275	17,862	42,137	* 351	* 0·82	73·58
1889 ..	25,066	18,632	43,698	1,561	3·70	74·33
1890 ..	26,794	19,496	46,290	2,592	5·93	72·76
1891 ..	32,054	21,225	53,279	† 6,989	15·10	66·22
1892 ..	35,632	23,026	58,658	5,379	10·10	64·62
1893 ..	40,182	24,855	65,037	6,379	10·87	61·86
1894 ..	53,121	28,893	82,014	16,977	26·10	54·39
1895 ..	66,579	34,564	101,143	19,129	23·32	51·91
1896 ..	91,586	46,210	137,796	36,653	36·24	50·46
1897 ..	103,880	57,814	161,694	23,898	17·34	55·65
1898 ..	105,440	62,370	167,810	6,116	3·78	59·15
1899 ..	105,708	64,943	170,651	2,841	1·69	61·44
1900 ..	109,923	69,785	179,708	9,057	5·31	63·49
1901 ..	118,762	76,127	194,889	15,181	8·45	64·10

* Decrease. † 2,393 persons added on account of under-estimate revealed by Census.

It will be seen from the foregoing table that the number of females to each 100 males in the population, which had increased from 61 in 1840 to 77 in 1884, diminished with a slight fluctuation from the latter date till 31st December, 1896, when it stood as low as 50. From that date onward the number increased continuously, and at the end of 1901 had reached 64. The great disproportion between the sexes brought about during the period 1884 to 1896 was, of course, due to the rush to the goldfields, the immigrants being necessarily principally males. Now that that portion of the country has become more settled and habitable, the influx of women to join their husbands, or to obtain employment, combined with the diminution in the number of male immigrants, has tended slightly towards the gradual equalisation of the proportion of the sexes. One effect produced on the constitution of the population by the large proportionate adult male immigration is, that at the present time the

Digitized by Google



Digitized by Google

Digitized by Google

population of Western Australia contains a much larger proportion of adult males than any other State of Australasia. This fact must be taken carefully into account in dealing with all questions relating to Revenue, Expenditure, Indebtedness, or Taxation per head, as it is evident that a community comprising a very large proportion of males in the prime of life is of greater economic value, that is, has greater powers of producing wealth, in proportion to its numbers, than one in which there is a large proportion of women, children, and old men. Hence, for instance, a rate of indebtedness per head which would be excessive in the case of the latter might be merely normal as regards the former.

Mean Population.

As the population varies during the course of the year, it is necessary in making use of the figures for the purpose of exhibiting results *per capita* to obtain the average or mean population for each year. The methods adopted for this purpose, unfortunately, are not uniform in the different States of Australasia, and as a consequence give results not strictly comparable.

The method in use in Western Australia is as follows :—The mean for each month is obtained by adding the population at the beginning to that at the end of the month, and dividing by two; the twelve monthly means are then added together, and divided by twelve, to get the mean for the year.

The following table gives the mean population of Western Australia for each of the ten years, 1892 to 1901 :—

Year.	Mean Population.			
	Males.	Females.	Total.	No. of Females to 100 Males.
1892 ..	33,836	22,011	55,847	65·05
1893 ..	37,777	23,913	61,690	63·30
1894 ..	48,261	26,794	75,055	55·52
1895 ..	58,791	31,357	90,148	53·34
1896 ..	82,267	40,429	122,696	49·14
1897 ..	102,403	53,160	155,563	51·91
1898 ..	107,810	61,189	168,999	56·76
1899 ..	105,160	63,368	168,528	60·26
1900 ..	109,122	67,951	177,073	62·27
1901 ..	115,391	73,212	188,603	63·45

It may be of interest to note that the mean population is something more than a mere arithmetical average, since it represents the number of years of male and female life spent in the State during the years under review. Thus in the year 1901, the aggregate number of years of male life spent in Western Australia was 115,391, whilst the female was 73,212, partly contributed by those who passed the whole of the year in the State, and partly by those who, owing to birth, arrival, death, or departure during the course of a year, had spent in Western Australia only a portion of the year, and whose individual contributions to the aggregate were consequently fractional.

Digitized by Google

Populatio. ' Australasia.

The estimated population o ·h of the six States of the Commonwealth of Australia, and the Colony of New Zealand, on the 31st of December, 1901, and the percentage of the population of each on the total population of the Commonwealth and Australasia, respectively, were as follows :—

State or Colony	Population on 31st December, 1901.			Percentage on total Population.	
	Males.	Females.	Total	Of Commonwealth.	Of Australasia.
Western Australia ..	118,762	76,127	194,889	5·08	4·22
New South Wales ..	722,760	656,940	1,379,700	36·00	29·86
Victoria	607,283	601,422	1,208,705	31·54	26·16
Queensland	284,347	226,168	510,515	13·32	11·05
South Australia	185,372	179,423	364,795	9·52	7·89
Tasmania	90,267	83,966	174,233	4·54	3·77
Total, Commonwealth ..	2,008,791	1,824,046	3,832,837	100·00	82·95
New Zealand	414,223	373,434	787,657	..	17·05
Total, Australasia ..	2,423,014	2,197,480	4,620,494	..	100·00

The following is an estimate of the population of each of the Australasian capitals on 31st December, 1901 :—

CAPITAL (including suburbs).		Population.		
Name.	Area in square miles.	Males.	Females.	Total.
Perth	25	20,230	18,170	38,400
Sydney	142	246,160	250,830	496,990
Melbourne	254	237,130	264,450	501,580
Brisbane	305	*59,245	*60,183	*119,428
Adelaide	262	78,278	[illegible]	163,430
Hobart	99	16,422	[illegible]	34,682
Wellington	21	†	†	*49,344

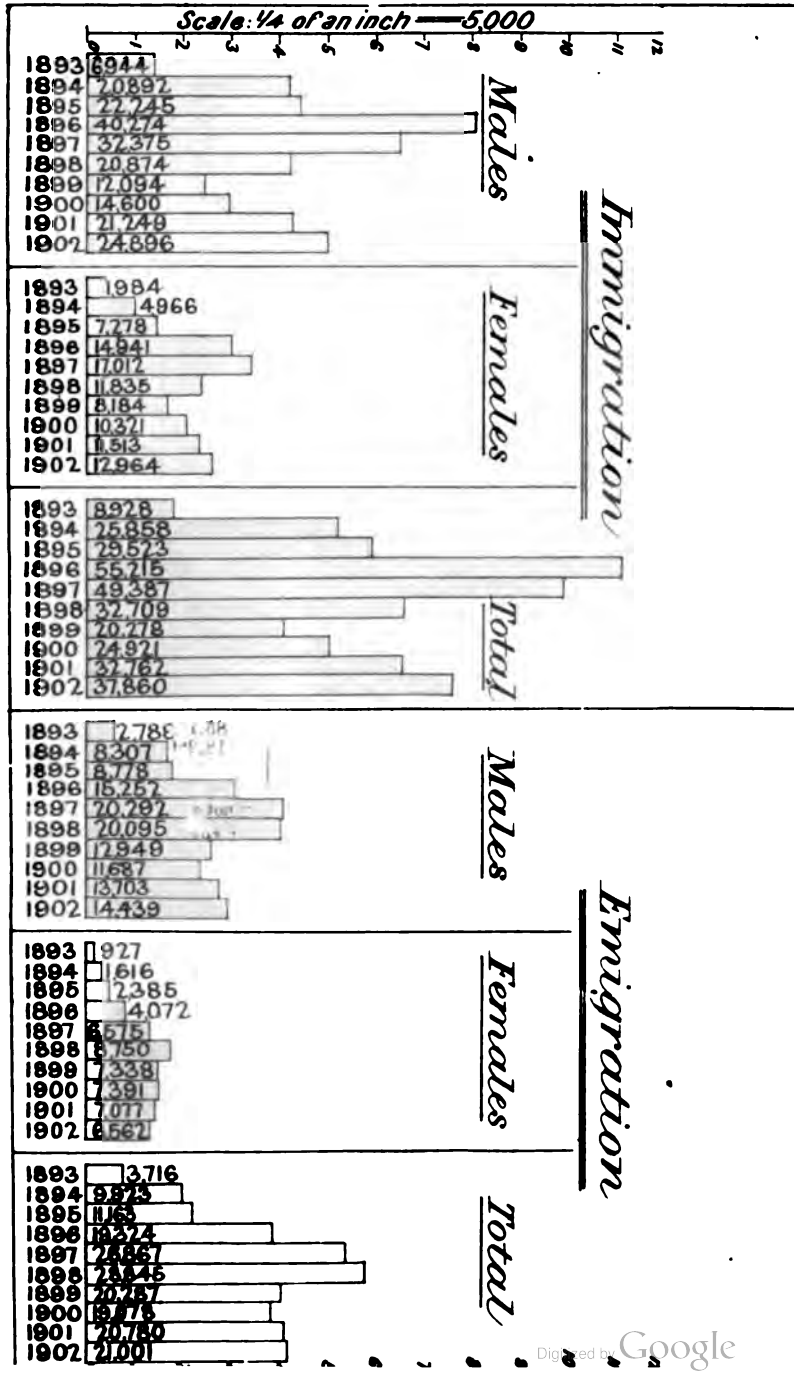
* Population on 31st March, 1901. † Details [illegible] vailable.

The estimated population within a radius of [illegible] miles from the Perth Town Hall on 31st March, 1901, was 66,832, of whom 36,615 were males, and 30,217 females. The area, exclusive of ocean and river, comprised within this circle, is approximately 264 square miles.

2.—IMMIGRATION AND EMIGRATION.

The phenomenal increase in the population of Western Australia during the past decade has, of course, been very largely due to the excess of the number of Immigrants to these shores over that of Emigrants therefrom. From the annexed table, however, showing Immigration and Emigration particulars for the ten years 1892 to

Digitized by Google



Digitized by Google

Digitized by Google

1901, it will be seen that this excess did not exhibit any approach to uniformity during the period, but that, on the contrary, considerable fluctuations were experienced. The greatest addition to population from this source took place in 1896, when, owing to the number of arrivals reaching the large total of 55,2 5 as against 19,324 departures, the net gain by immigration amounted to no less than 35,891. Low water mark was reached three years later, in 1899, when the number of departures actually exceeded the number of arrivals by 9. The returns for 1900, however showed a considerable improvement, a net gain of 5,843 being recorded, while for 1901 a further advance to 11,982 was made :—

Year.	Immigration.			Emigration.			Excess of Immigration over Emigration.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
1892	5,363	2,077	7,440	2,123	855	2,978	3,240	1,222	4,462
1893	6,944	1,984	8,928	2,789	927	3,716	4,155	1,057	5,212
1894	20,892	4,966	25,858	8,307	1,616	9,923	12,585	3,350	15,935
1895	22,245	7,278	29,523	8,778	2,385	11,163	13,467	4,893	18,360
1896	40,274	14,941	55,215	15,252	4,072	19,324	25,022	10,869	35,891
1897	32,375	17,012	49,387	20,292	6,575	26,867	12,083	10,437	22,520
1898	20,874	11,835	32,709	20,095	8,750	28,845	779	3,085	3,864
1899	12,094	8,184	20,278	12,949	7,338	20,287	*855	846	*9
1900	14,600	10,321	24,921	11,687	7,391	19,078	2,913	2,930	5,843
1901	21,249	11,513	32,762	13,703	7,077	20,780	7,546	4,436	11,982
Total ..	196,910	90,111	287,021	115,975	46,986	162,961	..	..	..
Net Excess of Immigration over Emigration during the Ten Years 1892 to 1901							80,935	43,125	124,060

*Excess of Emigration over Immigration.

Digitized by Google

The particulars relating to Immigration and Emigration for each month of 1901 are as follows :—

Month.	Immigration.						
	Adults (12 years and upwards).		Children under 12 Years.		Total.		
	Males.	Females.	Males.	Females.	Males.	Females.	Total.
1901.							
January ..	1,771	608	102	118	1,873	726	2,599
February ..	1,884	807	180	204	2,064	1,011	3,075
March ..	1,763	923	229	209	1,992	1,132	3,124
April ..	1,614	823	195	210	1,809	1,033	2,842
May ..	2,019	890	214	205	2,233	1,095	3,328
June ..	1,725	888	202	187	1,927	1,075	3,002
July ..	1,496	843	152	150	1,648	993	2,641
August ..	1,361	587	142	133	1,503	720	2,223
September ..	1,237	671	178	162	1,415	833	2,248
October ..	1,398	780	225	208	1,623	988	2,611
November ..	1,260	682	138	121	1,398	803	2,201
December ..	1,562	918	202	186	1,764	1,104	2,868
Total ..	19,090	9,420	2,159	2,093	21,249	11,513	32,762

Month.	Emigration.						
	Adults (12 Years and upwards).		Children under 12 Years.		Total.		
	Males.	Females.	Males.	Females.	Males.	Females.	Total.
1901.							
January ..	878	543	125	119	1,003	662	1,665
February ..	939	465	122	129	1,061	594	1,655
March ..	1,120	503	113	125	1,233	628	1,861
April ..	1,561	578	96	94	1,657	672	2,329
May ..	887	455	85	88	972	543	1,515
June ..	631	235	50	52	681	287	968
July ..	602	220	45	47	647	267	914
August ..	737	349	65	80	802	429	1,231
September ..	885	438	85	71	970	509	1,479
October ..	1,115	487	115	103	1,230	590	1,820
November ..	1,142	642	165	158	1,307	800	2,107
December ..	1,928	885	212	211	2,140	1,096	3,236
Total ..	12,425	5,800	1,278	1,277	13,703	7,077	20,780

Assisted Immigration.

During the ten years 1892 to 1901, Free and Nominated Immigrants to the number of 1,557 were introduced into Western Australia.

Digitized by Google

The following table, which distinguishes between males and females and adults and children, gives the particulars for each of the ten years :—

Year.	Adults. (12 years and upwards.)			Children under 12 years of age.			Grand Total.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
1892 ..	..	..	..	..	..	..	168	149	317
1893 ..	..	..	..	..	..	..	54	132	186
1894 ..	11	169	180	6	13	19	17	182	199
1895 ..	23	110	133	5	6	11	28	116	144
1896 ..	9	117	126	3	7	10	12	124	136
1897 ..	25	129	154	15	11	26	40	140	180
1898 ..	29	63	92	..	5	5	29	68	97
1899 ..	17	24	41	4	4	8	21	28	49
1900 ..	25	70	95	12	17	29	37	87	124
1901 ..	26	41	67	30	28	58	56	69	125

3.—NATURALISATION.

In the table given below the number and birthplaces of the persons who have received certificates of naturalisation in Western Australia since the passing of "The Naturalisation Act, 1871" (35 Vict., No. 2), are shown :—

Birthplace.	1871-91.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	Total.
Asia Minor ..	..	..	..	..	..	1	..	..	..	..	..	1
Austria-Hungary	3	..	..	2	..	1	2	3	2	..	1	14
Belgium ..	..	..	..	1	..	1	..	1	..	..	..	3
Brazil ..	1	..	..	..	..	..	..	..	..	..	..	1
China ..	22	..	..	..	..	..	..	..	..	..	..	22
Denmark ..	2	..	1	1	..	1	3	1	2	4	4	19
Finland ..	..	..	..	..	..	1	..	2	1	1	3	8
France ..	3	..	..	..	..	..	1	4	..	..	2	10
Germany ..	18	2	..	3	2	9	24	9	11	39	14	131
Greece ..	..	..	..	..	..	..	..	2	..	1	4	7
Holland ..	1	..	1	1	..	..	..	1	..	..	..	4
Italy ..	3	..	..	..	..	2	2	5	5	6	5	28
New Caledonia	..	..	..	..	..	..	..	..	..	1	..	1
Norway ..	2	..	..	..	2	..	1	1	2	5	6	19
Palestine ..	..	..	..	..	..	1	..	..	..	..	..	1
Penang Island	1	..	..	..	..	..	..	..	..	..	..	1
Philippine Islands	..	1	..	..	..	..	..	..	..	..	..	1
Poland ..	..	..	..	..	..	..	..	..	1	5	..	6
Roumania ..	..	..	..	..	..	..	..	1	..	..	..	1
Russia ..	10	1	1	1	6	3	1	3	1	6	10	43
Spain ..	12	..	..	..	45	..	4	..	1	1	1	64
Sweden ..	7	1	..	2	..	2	4	9	8	13	9	55
Switzerland ..	1	2	..	..	..	..	..	..	..	2	1	6
Timor ..	1	..	..	..	..	..	..	..	..	..	..	1
Turkey ..	..	..	1	..	..	..	..	2	..	..	1	4
U.S.A. ..	3	..	..	..	..	..	2	1				7
Total ..	90	7	4	11	55	22	44	45	34	85	61	458

Digitized by Google

4.—THE CENSUS OF 1901.

At a meeting of Australasian Premiers held in Sydney on the 25th January, 1900, it was decided that a Conference of Government Statisticians should be held to arrange for the Collection and Compilation of the Census of 1901 upon a uniform principle. In compliance with this decision, a Conference took place in Sydney on the 26th February and the following days, each of the seven Australasian Colonies being represented by the officer in charge of the Statistical Department of his Colony.

The business of the Conference consisted in discussing, and agreeing to, such measures as would lead to uniformity in the following particulars: (1.) The date of the Census. (2.) The Questions to be asked. (3.) The methods of compiling the results.

The practice adopted by the Imperial Government of taking the Census for the night of the first Sunday in April would, it was felt, be extremely inconvenient on this occasion, as it would result in the Census being taken for the night of Easter Sunday, a date on which, owing to the holidays, the population would be considerably displaced.

As also the climatic conditions usually experienced in the Northern and Interior portions of Australia, represented respectively by floods and drought, are such as to render travelling during March both difficult and dangerous, it was thought advisable that, if any departure was made from the usual custom, a later rather than an earlier date had better be chosen, so Sunday the 28th of April was selected.

This selection was subsequently, however, over-ruled by a decision on the part of the Premiers of the several States, that, notwithstanding the recognised objections, the Census should be taken on the date fixed by the Imperial authorities for the Census of the United Kingdom, namely, on Sunday the 31st March.

The results achieved by the Conference may be briefly stated as being the mutual adoption of a uniform procedure, by which the Census authorities throughout Australasia agreed to ask the same questions on the same date, and present the results in the various reports drawn up by them as nearly as practicable in the same manner.

The following summaries furnish a few of the principal results obtained under each head of enquiry in this State, but if more detailed information is required reference must be made to the Census Report.

The original intention in connection with the Census of this State was to exclude all aboriginals, whether full-blooded or half-caste, from the returns of general population, and deal separately with the information respecting them. When, however, the tabulation of particulars relating to Habitations had been practically completed, a notification was received that an opinion had been given by the Honourable the Attorney General of the Commonwealth to the effect that "in reckon-

Digitized by Google

ing the population of the Commonwealth, half-castes are not aboriginal natives within the meaning of Section 127 of 'the Commonwealth of Australia Constitution Act,' and should therefore be included." In order, consequently, to avoid the creation of two sets of population figures, half-caste aboriginals have been included in the total of the general population, and in all detailed tabulations except those relating to habitations, while particulars concerning full-blooded Aboriginals have been excluded from all tables with the exception of those specially dealing with Aboriginals.

Classified according to place of abode, the total population of 184,124 was, at the date of the Census, distributed as follows :—

Particulars.	Persons.
Inmates of Habitations	178,289
Persons camping out (including railway travellers)	716
Shipping population	4,168
Half-caste Aboriginals (not included in foregoing)	951
Total	184,124

Habitations.

This table gives the number of houses, the outer walls of which were constructed of one of each of the different classes of material specified, the particulars being further sub-divided so as to show the number Occupied, Unoccupied, and Being Built :—

Materials.	Occupied Houses.	Unoccupied Houses.	Houses being built.	Total.	Percentage on total number of Habitations of specified materials.
Stone	3,791	122	18	3,931	7·79
Brick	8,050	241	81	8,372	16·59
Concrete, Adobe, Pisé ..	1,103	53	8	1,164	2·31
Iron	5,244	333	12	5,589	11·07
Wood	11,594	642	60	12,296	24·36
Wattle and Dab, Mud, Bark, etc.	464	30	1	495	0·98
Calico, Canvas, Hessian ..	17,921	702	5	18,628	36·90
Total specified	48,167	2,123	185	50,475	100·00
Unspecified	339	140	16	495	
Grand Total	48,506	2,263	201	50,970	

It will be seen that no fewer than 18,628 of the habitations enumerated, or about 37 per cent. of the total specified, were built of "calico, canvas, or hessian," constituting the usual Canvas Town of a *gold rush*. In a very great number of cases the *dwellings so designated* are not what are ordinarily known

Digitized by Google

tents, but consist of a wooden frame covered with hessian, and in some instances contain several rooms. The number of wooden houses amounted to rather more than 24 per cent. of the total specified, while the number of houses built of stone and brick was almost identical with the number built of wood, the figures being stone and brick, 12,303; wood, 12,296.

From the subjoined table, which gives the number of inmates of houses of various materials, it will be seen that rather more than 37 per cent. lived in houses built of stone or brick, about 26½ per cent. in wooden houses, and about 21½ per cent. in those constructed of calico, canvas, or hessian. The average number of persons to an occupied dwelling was highest for stone houses, and lowest for those of calico, canvas, or hessian, being 5·77 in the former, and 2·14 in the latter case.

Materials.	Occupied Houses.	Inmates.		Persons to an Occupied House.
		Number.	Percentage on total specified.	
Stone	3,791	21,877	12·34	5·77
Brick	8,050	44,431	25·06	5·52
Concrete, Adobe, Pisé	1,103	5,277	2·98	4·78
Iron	5,244	19,159	10·81	3·65
Wood	11,594	46,999	26·52	4·05
Wattle and Dab, Mud, Bark, etc. ..	464	1,135	0·64	2·45
Calico, Canvas, Hessian	17,921	38,375	21·65	2·14
Total specified	48,167	177,253	100·00	3·68
Unspecified	339	1,036	..	3·06
Grand Total	48,506	178,289	..	3·68

In the following table, houses, occupied, unoccupied, and being built, have been classified according to the number of rooms contained:

Number of Rooms in Habitations.	Occupied Houses.	Unoccupied Houses.	Houses being built.	Grand Total.	Percentage on total number of Habitations of specified number of rooms.
					%
One room	13,804	673	8	14,485	28·76
Two rooms	6,755	522	31	7,308	14·51
Three and four rooms ..	16,504	694	80	17,278	34·31
Five and six rooms	7,129	148	42	7,319	14·53
Seven to ten rooms	2,814	62	10	2,886	5·73
Eleven to fifteen rooms ..	640	5	2	647	1·29
Sixteen to twenty rooms ..	221	4	1	226	0·45
Over twenty rooms	208	..	1	209	0·42
Total specified	48,075	2,108	175	50,358	100·00
Unspecified	431	155	26	612	
Grand Total	48,506	2,263	201	50,970	

Digitized by Google

About 43 per cent. of the dwellings contained less than three rooms, and about 57 per cent. three rooms and upwards. The great proportion of houses containing a small number of rooms is principally due to the large number of temporary residences of calico, canvas and hessian in use on the various goldfields of the State.

Particulars relative to the inmates of houses of various sizes are furnished in the annexed table, from which it will be seen that about 21 per cent. were living in residences containing less than three rooms, and about 79 per cent. in those consisting of three rooms and upwards :—

Number of Rooms in Habitations.	Occupied Houses.	Inmates.		Persons to an occupied house.
		Number.	Percentage on total specified.	
One room	13,804	18,987	10·73	1·38
Two rooms	6,755	17,888	10·12	2·65
Three and four rooms	16,504	66,930	37·84	4·06
Five and six rooms	7,129	38,619	21·84	5·42
Seven to ten rooms	2,814	19,158	10·83	6·81
Eleven to fifteen rooms	640	6,192	3·50	9·67
Sixteen to twenty rooms	221	3,309	1·87	14·97
Over twenty rooms	208	5,775	3·27	27·76
Total specified	48,075	176,858	100·00	3·68
Unspecified	431	1,431	..	3·32
Grand Total	48,506	178,289	..	3·68

In addition to those residing ashore, there were at the date of the Census 4,168 persons living on board of vessels of various kinds in Western Australian waters, particulars relative to these being as follows :—

Description of Vessel.	Number.	Net Registered Tonnage.	Persons on Board.		
			Males.	Females.	Total.
Steamers	33	39,664	1,859	485	2,344
Ships, Barques, and Barquentines	27	28,932	363	5	368
Brigs, Brigantines and Schooners..	45	2,147	518	15	533
Ketches, Cutters, Smacks, Luggers, etc.	183	2,402	898	2	900
Hulks and Dredges	11	..	19	4	23
Total	299	73,145	3,657	511	4,168

Digitized by Google

Ages.

The following table furnishes details concerning the ages of the people :—

Age.	Males.	Females.	Total.
Under 1 year	2,572	2,455	5,027
1 year and under 5	7,869	7,779	15,648
5 years and under 10	8,891	8,856	17,747
10 years and under 15	7,505	7,320	14,825
Unspecified children	8	15	23
15 years and under 20	7,088	5,849	12,937
20 „ „ 21	1,957	1,278	3,235
Total under 21	35,890	33,552	69,442
21 years and under 25	9,884	6,001	15,885
25 „ „ 30	15,822	8,677	24,499
30 „ „ 35	14,845	7,298	22,143
35 „ „ 40	12,441	5,322	17,763
40 „ „ 45	8,722	3,391	12,113
45 „ „ 50	5,220	2,151	7,371
50 „ „ 55	3,453	1,678	5,131
55 „ „ 60	2,311	1,177	3,488
60 „ „ 65	1,767	908	2,675
65 „ „ 70	1,101	570	1,671
70 „ „ 75	692	279	971
75 „ „ 80	290	133	423
80 „ „ 85	140	56	196
85 „ „ 90	30	21	51
90 „ „ 95	5	3	8
95 „ „ 100	1	1	2
Unspecified Adults	261	31	292
Total 21 and upwards	76,985	37,697	114,682
Grand Total	112,875	71,249	184,124

Out of the total population of 184,124, no fewer than 114,682, or about 62 per cent., were of the age of 21 and upwards, the percentages in the cases of males and females separately being 68 and 53 respectively. The quinquennial age group containing the largest number of persons was that of "25 years and under 30," the total therein amounting to 24,499, while the group "30 years and under 35," with 22,143, was second in order of importance. Between the ages of 21 and 45 there were 92,403 persons, or almost exactly 50 per cent. of the total population. The average ages at the date of the Census were: Males, 28·01; Females, 23·21; Persons, 26·15.

A popular division of the male population, based on their bread-winning capabilities, separates them into three groups, according as they are of "dependent age," "supporting age," or "old age." The result of such a classification for this State is as follows :—

Age.	Period of Life.	Males. Number.	Males. Percentage on Total Males.
Under 15 years	Dependent age ..	26,845	23·78
15 years and under 65 ..	Supporting age ..	83,771	74·22
65 years and upwards ..	Old age	2,259	2·00
Total	.. ..	112,875	100·00

Digitized by Google

The following is a somewhat similar classification of the female population, based, however, on reproductive instead of on bread-winning capabilities :—

Age.	Period of Life.	Females.	
		Number.	Percentage on Total Females.
Under 15	Immature	26,425	37·09
15 years and under 50 ..	Reproductive	39,998	56·14
50 years and upwards	Sterile	4,826	6·77
Total	.. ..	71,249	100·00

The number of persons aged 65 years and upwards at the date of the Census was 3,322, of whom 2,259 were males, and 1,063 females.

The number of males at what has been termed "Military age," that is, between 20 and 40, was at the date of the Census 54,949, or about 30 per cent. of the total population.

Birthplaces.

The following table gives a classification of the population according to birthplace :—

Birthplace.	Males.	Females.	Total.
AUSTRALASIA -			
Commonwealth of Australia :			
Western Australia	26,529	26,134	52,663
New South Wales	8,395	5,727	14,122
Victoria	24,342	15,149	39,491
Queensland	1,474	1,121	2,595
South Australia	9,686	6,564	16,250
Tasmania	1,071	679	1,750
Australia (undefined)	61	20	81
Total, Commonwealth	71,558	55,394	126,952
New Zealand	1,757	947	2,704
Fiji	21	16	37
Total, Australasia	73,336	56,357	129,693
EUROPE -			
England (including Channel Isles, Scilly Isles, and Isle of Man)	17,212	8,164	25,376
Wales (including Isle of Anglesey) ..	644	265	909
Scotland (including Shetland and Orkney Isles)	3,953	1,447	5,400
Ireland	6,413	3,449	9,862
Great Britain (undefined)	3	1	4
Austria-Hungary	390	28	418
Belgium	25	5	30
Denmark (including Iceland)	281	39	320
France (including Corsica)	170	84	254

Digitized by Google

Birthplaces—continued.

Birthplace.	Males.	Females.	Total.
EUROPE—*continued.*			
Germany	1,255	267	1,522
Greece	146	2	148
Holland	36	5	41
Italy	1,296	58	1,354
Norway	405	15	420
Portugal	37	3	40
Russia	323	66	389
Spain	142	9	151
Sweden	715	39	754
Switzerland	98	20	118
Other European Countries	88	29	117
Total, Europe	33,632	13,995	47,627
ASIA—			
British India	625	123	748
Ceylon	67	17	84
Straits Settlements	323	9	332
Afghanistan	261	..	261
China	1,459	16	1,475
Japan	658	209	867
Java	226	4	230
Philippine Islands	370	..	370
Other Asiatic Countries	427	16	443
Total, Asia	4,416	394	4,810
AFRICA—			
Cape Colony	27	16	43
Mauritius	58	20	78
Other African Countries	75	47	122
Total, Africa	160	83	243
AMERICA—			
Canada	205	62	267
United States of America	526	132	658
Other American Countries	187	39	226
Total, America	918	233	1,151
Polynesia	31	10	41
At Sea	182	135	317
Unspecified	200	42	242
GRAND TOTAL	112,875	71,249	184,124

The Western Australian born portion of the population at the date of the Census numbered only 55,663 persons (26,529 males and 26,134 females), or less than 29 per cent. of the total. As regards the remainder of the population, Victoria was the largest contributor, the number who claimed that State as their birthplace being 39,491, of whom 24,342 were males and 15,149 females. It will thus be seen that the number of Western Australian born males exceeded the number of Victorian born by only 2,187. Next to Victoria the largest contributor to the Western Australian population was England, with

Digitized by Google

a total of 25,376 persons, 17,212 being males, and 8,164 females. Then followed South Australia, 16,250; New South Wales, 14,122; Ireland, 9,862; and Scotland, 5,400. The number of Australasian born was 129,693, or about 70 per cent. of the total population.

The population under 21 years of age and of 21 years and upwards, for various birthplaces, is as follows:—

Birthplace.	Males.		Females.		Persons.		
	Under 21 years.	21 years and upwards.	Under 21 years.	21 years and upwards.	Under 21 years.	21 years and upwards.	Total.
British Empire—							
Australasia:							
Commonwealth of Australia	33,454	38,104	31,863	23,531	65,317	61,635	126,952
New Zealand	420	1,337	323	624	743	1,961	2,704
Fiji	6	15	8	8	14	23	37
United Kingdom	1,299	26,926	1,123	12,203	2,422	39,129	41,551
Other British Possessions	130	1,339	58	242	188	1,581	1,769
Foreign Countries—							
European	318	5,050	73	573	391	5,623	6,014
Asiatic	178	3,193	30	214	208	3,407	3,615
African	16	42	13	23	29	65	94
American	34	606	29	125	63	731	794
Polynesian	5	21	2	7	7	28	35
At Sea	19	163	20	115	39	278	317
Unspecified	11	189	10	32	21	221	242
Total	35,890	76,985	33,552	37,697	69,442	114,682	184,124

Digitized by Google

Between the dates of the Censuses of 1891 and 1901 the population of Western Australia increased by 134,342 persons, of whom only 24,838 were what may be termed the natural increase of the State, being the excess of those born within its boundaries over the number of Western Australian born who died or left the State during the decade, whilst those residents of Western Australia who claimed to have first seen the light in one or other of the five remaining States of the Commonwealth increased during the same period by 71,219. If to these figures there be added the increase of 2,557 amongst those who recorded their birthplaces as New Zealand or Fiji, it will be seen that there has been in all a net gain of 98,614 in the Australasian born population of the State, leaving a balance of 35,728 due to increases amongst those born in other parts of the world.

Of this balance, 32,148 are accounted for by additions to the numbers of European birth, the number born in Great Britain having increased by no fewer than 27,015, those born in Italy by 1,318, those in Germany by 1,232, and those in Sweden and Norway by 970, while increases of 389 and 318 were experienced in the number who hailed from Austria-Hungary and Russia respectively. The natives of Denmark showed an advance of 278, France 182, and Greece 131, the remaining 315 being distributed amongst—Switzerland, 103; Spain, 62; Portugal, 30; Belgium, 26; Holland, 22; and other minor European States, 72.

Of the remainder, the Asiatic born were responsible for an increase of 2,341, the principal contributors thereto being Japan, 607; China, 561; and British India, 503. Those born in Africa increased by only 124, while the number of American born experienced a gain of 773, of which 189 were due to Canada. Advances of 13 in the number born in Polynesia, 203 in the number born at sea, and 126 in the number of those whose birthplaces were unspecified, make up the 342 which constitute the balance of the total gain.

Religions.

Particulars relative to religions are as follows:—

Religion.	Total.		
	Males.	Females.	Total.
I.—CHRISTIAN:—			
Church of England	45,027	30,672	75,654
Methodist	13,969	10,571	24,540
Presbyterian	9,252	5,455	14,707
Congregational	2,406	1,998	4,404
Baptist	1,625	1,289	2,914
Church of Christ	534	511	1,045
Salvation Army	971	719	1,690
Lutheran	1,401	302	1,703
Seventh Day Adventist ..	101	110	211

Digitized by Google

Religions—continued.

Religion.	Total.		
	Males.	Females.	Total.
I.—CHRISTIAN—*continued.*			
Unitarian	116	34	150
Protestant (undefined) ..	1,206	641	1,847
Roman Catholic	24,623	15,961	40,584
Greek Catholic	170	2	172
Catholic (undefined)	840	469	1,309
Other Christians	323	238	561
II.—NON-CHRISTIAN—			
Jew, Hebrew, Israelite ..	755	504	1,259
Mahomedan	1,176	15	1,191
Buddhist	656	105	761
Confucian	74	..	74
Others	129	28	157
III.—INDEFINITE—			
No Denomination	1,450	411	1,861
Freethinker	1,219	106	1,325
Agnostic	99	7	106
Others	95	50	145
IV.—NO RELIGION—			
Atheist	32	3	35
No Religion	1,100	266	1,366
Pagan	252	12	264
Others	7	3	10
V.—OBJECT TO STATE	2,429	624	3,053
VI.—UNSPECIFIED	838	188	1,026
Total	112,875	71,249	184,124

In the case of the query relating to religion, it was agreed at the Conference of Statisticians that the furnishing of an answer should be optional, and that any person having an objection to stating his or her religious belief might write the word "object" in the column provided for Religion. 3,053 persons availed themselves of this provision, and as in 1,026 other cases no entry of any sort was made, there remain 180,045 persons who professed some form either of belief or disbelief. Of this number 75,654 professed adherence to the Church of England, 40,584 to the Roman Catholic Church; 24,540 to the various divisions of the now amalgamated Methodist Church, and 14,707 to the Presbyterian Church. In addition to the 40,584 shown above as belonging to the Roman Catholic Church, there were 1,309 returned simply as "Catholics," the majority of whom were probably Roman *Catholics*. If these be added to it, the Roman *Catholic total will then amount* to 41,893.

Digitized by Google

Conjugal Condition.

The attached table furnishes particulars concerning Conjugal Condition in conjunction with age :—

Age.	Married.		Never Married.		Widowed.		Divorced.		Not stated.		Total.		
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Total.
* Under 14 years ..	..	..	25,426	25,098	..	..	..	..	..	..	25,426	25,098	50,524
14 years and under 15	..	..	1,419	1,327	..	..	..	..	..	..	1,419	1,327	2,746
15 " " 16	..	1	1,364	1,201	..	..	..	..	..	1	1,364	1,203	2,567
16 " " 17	2	7	1,326	1,187	..	..	..	..	..	..	1,328	1,194	2,522
17 " " 18	..	30	1,293	1,053	..	..	..	..	..	1	1,293	1,084	2,377
18 " " 19	6	116	1,417	1,084	..	..	..	..	..	..	1,423	1,200	2,623
19 " " 20	8	190	1,672	977	..	1	..	..	..	..	1,680	1,168	2,848
20 " " 21	39	376	1,915	901	3	..	..	..	..	1	1,957	1,278	3,235
21 " " 25	886	2,704	8,949	3,248	14	36	6	2	29	11	9,884	6,001	15,885
25 " " 30	4,501	5,920	11,171	2,605	95	128	9	12	46	12	15,822	8,677	24,499
30 " " 35	6,530	5,936	8,044	1,104	216	247	18	8	37	3	14,845	7,298	22,143
35 " " 40	6,557	4,434	5,486	568	352	305	25	10	21	5	12,441	5,322	17,763
40 " " 45	4,896	2,803	3,376	279	409	298	23	7	18	4	8,722	3,391	12,113
45 " " 50	3,121	1,715	1,729	169	348	266	11	1	11	..	5,220	2,151	7,371
50 " " 55	2,050	1,214	1,035	86	343	376	13	2	12	..	3,453	1,678	5,131
55 " " 60	1,433	740	578	51	290	385	2	..	8	1	2,311	1,177	3,488
60 " " 65	967	458	496	29	294	420	2	..	8	1	1,767	908	2,675
65 " " 70	554	253	331	14	211	303	2	..	3	..	1,101	570	1,671
70 " " 75	283	88	205	5	201	183	..	..	3	3	692	279	971
75 " " 80	133	33	85	5	72	95	..	..	..	..	290	133	423
80 " " 85	56	9	24	3	59	44	..	..	1	..	140	56	196
85 years and upwards ..	12	2	6	2	17	21	..	..	1	..	36	25	61
Unspecified adults ..	29	14	109	8	8	4	..	..	115	5	261	31	292
Total	32,063	27,043	77,456	41,004	2,932	3,112	111	42	313	48	112,875	71,249	184,124

* Including children of unspecified age.

Digitized by Google

Under the law of England, which in this respect holds good also in this State, an infant who has reached the age of 14 years, if a male, or 12 years, if a female, can contract a valid marriage. The youngest age, however, at which persons were returned on the Census Schedules of this State as married was 15 in the case of females and 16 in the case of males, there being one recorded in the former instance and two in the latter. Fifty-five only of the married males were under 21 years of age, as compared with 720 of the married females, whilst there were in the State 5,020 more married males of all ages than married females. The disproportion between the number of the "never married" males and females of adult age is very marked. Thus, the number of never married males, aged 21 and upwards, was 41,624, while the number of females of 21 and upwards, similarly situated, amounted to only 8,176, proportionately about one-fifth. A slight excess of females, however, occurs in the case of widowed persons, the number of widows exceeding the number of widowers by 180; but amongst the divorced, and also amongst those whose conjugal condition was unspecified, the males again largely preponderate.

Education.

In the following table the population has been tabulated according to Education in conjunction with age:—

Degree of Education.	Under 3 years.	3 years and under 6.	6 years and under 14.	14 years and under 21.	21 years and upwards.	Unspecified.	Total.
English Language—							
Read and Write—							
Males	..	204	11,006	9,885	69,759	114	90,968
Females	..	211	11,031	8,236	35,682	28	55,188
Read only—							
Males	..	340	687	45	555	..	1,627
Females	..	313	579	24	488	..	1,404
Foreign Language only—							
Read and Write—							
Males	..	..	14	214	2,575	10	2,813
Females	..	..	..	17	223	1	241
Read only—							
Males	..	..	..	2	49	..	51
Females	..	..	..	1	5	..	6
Cannot read—							
Males	6,836	4,803	1,430	280	3,305	33	16,687
Females	6,741	4,653	1,434	135	1,071	14	14,048
Not stated—							
Males	..	21	77	38	481	112	729
Females	..	44	77	41	197	3	362
Total—							
Males	6,836	5,368	13,214	10,464	76,724	269	112,8[illegible]
Females	6,741	5,221	13,121	8,454	37,666	46	71,[illegible]

Digitized by Google

Out of the total population of 184,124, the degree of education of 1,091 was unspecified. Of the remaining 183,033, there were 146,156 who were able to read and write English, 3,031 who could read English but not write it, 3054 who could read and write some Foreign Language, but could not read English, and 57 who could read some Foreign Language but could not write it nor yet read English, while 30,735 were returned as being unable to read any language. Of these latter, however, no fewer than 23,033, or about 75 per cent., were under the age of 6 years.

Schooling.

Particulars relative to the number of children receiving instruction are as follows :—

Place of Instruction.		3 years and under 6.	6 years and under 14.	14 years and under 21.	Unspecified.	Total.
State School	Males ..	926	9,047	503	..	10,476
	Females ..	828	8,081	581	4	9,494
Private School	Males ..	70	519	83	..	672
	Females ..	72	873	200	..	1,145
Denominational School ..	Males ..	198	1,776	181	..	2,155
	Females ..	186	2,092	266	1	2,545
At Home	Males ..	355	782	90	1	1,228
	Females ..	381	948	110	..	1,439
School not stated	Males ..	21	106	14	1	142
	Females ..	13	109	14	..	136
Total receiving Instruction	Males ..	1,570	12,230	871	2	14,673
	Females ..	1,480	12,103	1,171	5	14,759

It will be seen, therefore, that out of a total of 29,432 children receiving instruction at the date of the Census, 19,970, or about 68 per cent., were being educated at State Schools ; 4,700, or almost 16 per cent., at Denominational Schools ; 2,667, or slightly over 9 per cent., at home ; 1,817, or rather more than 6 per cent., at private schools ; while in the case of 278 children, or somewhat less than one per cent. of the total, the word " scholar " was inserted on the schedule, but the nature of the place of instruction was unspecified.

The number of children of school age (6 years and under 14) who were not recorded as receiving instruction of any kind was 2,002, of whom 984 were males and 1,018 females.

Length of Residence.

The only question asked on the 1901 Census Schedule that was *not included on* that for 1891, was one relating to the length of resi-

Digitized by Google

dence in Western Australia of persons not born in the State. The result of the inquiry was as follows :—

Length of Residence in Western Australia.	Males.	Females.	Total.
Under 1 year	9,065	5,043	14,108
1 year	4,852	3,352	8,204
2 years	4,638	4,036	8,674
3 „	7,806	6,880	14,686
4 „	12,673	8,323	20,996
Under 5 years	39,034	27,634	66,668
5 years and under 10	35,200	11,928	47,128
10 „ „ 15	5,077	1,898	6,975
15 „ „ 20	2,104	909	3,013
20 „ „ 25	748	326	1,074
25 „ „ 30	371	224	595
30 „ „ 35	494	278	772
35 „ „ 40	739	446	1,185
40 „ „ 45	535	383	918
45 „ „ 50	530	356	886
50 „ „ 55	232	115	347
55 „ „ 60	88	78	166
60 „ „ 65	37	33	70
65 „ „ 70	19	8	27
70 years and upwards	33	40	73
Unspecified	1,105	459	1,564
Western Australian born ..	26,529	26,134	52,663
Total	112,875	71,249	184,124

Excluding from the total population of 184,124 the number of Western Australian born, viz., 52,663, and also 1,564 whose length of residence was unspecified, there remain 129,897 immigrants to Western Australia whose length of residence therein was duly supplied. Of this number, 66,668, or more than 51 per cent., had resided in the State less than five years, while 47,128 others, or about 36 per cent., had been more than five but less than 10 years.

Sickness and Infirmity.

One of the heads of inquiry on the Census Schedule related to the number of persons who, at the date of the Census, were laid up or unable to follow their usual occupations owing to sickness or the result of accidents, and also the number who at that date were deaf and dumb or blind. The particulars furnished were as follows :—

Sickness and Infirmity.	Males.	Females.	Total.
Sickness	1,144	482	1,626
Accident	284	26	310
Deaf-mutism	20	10	30
Blindness	47	34	81
Total	1,495	552	2,047

Digitized by Google

Occupations.

The following table furnishes, in a summarised form, a classification of the population according to occupation :—

Occupation.		Males.	Females.	Total.
Class.	Designation.			
	SECTION A.—BREAD-WINNERS.			
I.	PROFESSIONAL—			
	Engaged in Government, defence, law, etc.	1,986	34	2,020
	Ministering to religion, charity, health, education, etc.	3,117	1,930	5,047
	Total, Class I.	5,103	1,964	7,067
II.	DOMESTIC—			
	Engaged in supplying board and lodging ..	2,474	3,278	5,752
	" domestic service and attendance ..	1,899	3,652	5,551
	Total, Class II.	4,373	6,930	11,303
III.	COMMERCIAL—			
	Dealing in property and finance	1,482	254	1,736
	" art and mechanic productions ..	728	131	859
	" textile fabrics, dress and fibrous materials	969	376	1,345
	" food, drinks, narcotics, and stimulants	2,596	294	2,890
	" animals, and animal and vegetable substances, N.E.I.	730	14	744
	" fuel and light	476	2	478
	" metals and other minerals ..	543	13	556
	General and undefined merchants and dealers	2,647	433	3,080
	Speculators on chance events	38	6	44
	Engaged in storage	71	..	71
	Total, Class III.	10,280	1,523	11,803
IV.	TRANSPORT AND COMMUNICATION—			
	Engaged in railway traffic	4,181	7	4,188
	" traffic on roads	2,327	5	2,332
	" traffic on seas and rivers	2,997	20	3,017
	" postal, telegraph, and telephone service	1,169	223	1,392
	Messengers, etc.	62	1	63
	Total, Class IV.	10,736	256	10,992
V.	INDUSTRIAL—			
	Working in art and mechanic productions ..	3,636	95	3,731
	" textile fabrics, dress, and fibrous materials	1,088	2,024	3,112
	" food, drinks, narcotics, and stimulants	1,638	74	1,712
	" animal and vegetable substances, N.E.I.	1,356	1	1,357
	" metals and other minerals ..	2,583	2	2,585
	" fuel, light, and other forms of energy	237	..	237
	Engaged in construction of buildings, roads, railways, etc.	5,827	1	5,828
	Engaged in disposal of dead and of refuse ..	222	..	222
	Undefined industrial pursuits	3,015	11	3,026
	Total, Class V.	19,602	2,208	21,810

Digitized by Google

Occupations—continued.

Class.	Occupation. Designation.	Males.	Females.	Total.
	SECTION A.—BREAD-WINNERS—*continued.*			
VI.	PRIMARY PRODUCERS—			
	Engaged in agricultural pursuits	8,322	285	8,607
	" pastoral pursuits	1,983	196	2,179
	" capture, etc., of wild animals and their products	85	2	87
	" fisheries	1,503	4	1,507
	forestry	2,177	..	2,177
	" water conservation and supply ..	1,176	1	1,177
	" mining and quarrying	19,835	3	19,838
	Total, Class VI.	35,081	491	35,572
VII.	INDEFINITE—(Of independent means)	207	117	324
	Total, Bread-winners	85,382	13,489	98,871
	SECTION B.—DEPENDENTS: NON-BREAD WINNERS.			
VIII.	DEPENDENTS—			
	Dependent on natural guardians	25,660	57,035	82,695
	Supported by voluntary and State contributions	1,170	492	1,662
	Criminal class (under legal detention) ..	399	44	443
	Total, Dependents	27,229	57,571	84,800
	UNSPECIFIED	264	189	453
	GRAND TOTAL	112,875	71,249	184,124

It will be seen that 98,871, or about 53 per cent. of the total population, have been classed as bread-winners, and 84,800 as dependents. Of the 453 who did not supply the required particulars, the majority would probably be found to belong to the former class.

The number of male bread-winners was 85,382, or about 76 per cent. of the total number of males; while in the case of females the number of bread-winners amounted to 13,489, or about 19 per cent. of the female total.

Amongst bread-winners, the class which contained the largest number of persons was that of Primary Producers, which embraces the occupations connected with the Agricultural, Pastoral, Timber, Mining, and other natural resources of the State. The aggregate for this class was 35,572, or about 38 per cent. of the total number of bread-winners, Mining and Quarrying, with 19,838, and Agricultural Pursuits, with 8,607, being the largest contributors.

The next in order of importance was the Industrial Class, with a total of 21,810, followed in order by the Commercial, with 11,803; Domestic, with 11,303; Transport and Communication, with 10,992, and Professional, with 7,067, while 324 were returned as being of independent means.

Digitized by Google

Chinese.

With a view to ascertaining the number of persons of Chinese race in the community, instructions were given in connection with the Census enumeration that all Chinese should on the Schedules be marked C., and all half-caste Chinese C.H.C., whether born in China or not.

The result of the investigation was as follows :—

Particulars.	Males.	Females.	Total.
Chinese—			
Full-blooded	1,503	18	1,521
Half-caste	23	25	48
Total	1,526	43	1,569

Of the 1,521 full-bloodod Chinese, 1,465 were born in China, 44 in other Asiatic countries, and 11 in Australasia, while in one case the birthplace was unspecified. Of the 48 half-castes, 43 were born in Australasia, three in China, and two in other Asiatic countries.

Aboriginals.

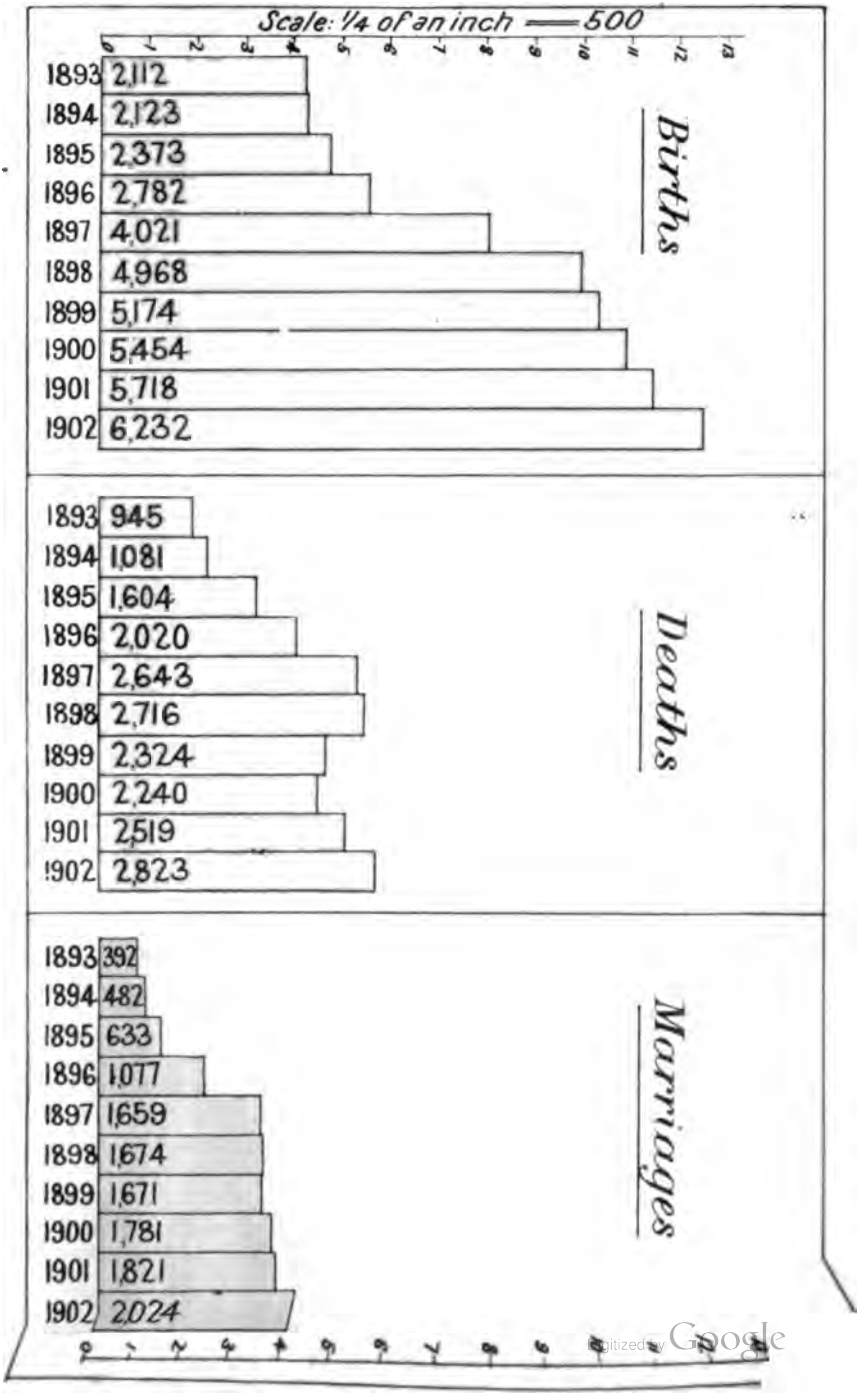
As mentioned on page 13, particulars relating to full-blooded Aboriginals have been excluded from all the tables respecting the general population, given on the foregoing pages.

Instructions were given to the Census Sub-enumerators to count all civilised or semi-civilised Aboriginals, that is, all who were either in the employ of whites or else were living in close proximity to the settlements of whites. They were at the same time instructed that no attempt need be made to enumerate those who were living in a wild state. The numbers recorded were as follows :—

Particulars.	Males.	Females.	Total.
Aboriginals—			
Full-blooded	2,933	2,328	5,261
Half-caste	492	459	951
Total	3,425	2,787	6,212

Of the 5,261 full-blooded Aboriginals shown above, 5,158 were born in Western Australia, 77 in South Australia, 24 in Queensland, and two in New South Wales. Of the 951 half-castes, 939 were born in Western Australia, nine in South Australia, two in Victoria, and one in New South Wales.

Digitized by Google



Digitized by Google

Digitized by Google

5.—VITAL STATISTICS.

A.—Births.

An interesting fact noticeable in all birth statistics, and one which, up to the present time, cannot be said to have been in any way satisfactorily explained, is the preponderance of male over female births. Several ingenious theories have been advanced to account for it, but the difficulty of practically testing any of them has, up to the present at all events, prevented the solution of the problem.

The total number of births (exclusive of still-births) registered in Western Australia during 1901 was 5,718, consisting of 2,946 boys and 2,772 girls—an increase of 264 on that of the preceding year. The following table shows the number registered in each of the ten years, 1892 to 1901, the birth-rate per 1,000 of the mean population, or "crude" birth-rate, and also the number of male births to each 100 females for each year :—

Year.	Number of Births registered during Year (exclusive of still-births).			Per 1,000 of mean population.	Number of males to each 100 females.
	Males.	Females.	Total.		
1892	959	889	1,848	33·09	107·87
1893	1,042	1,070	2,112	34·24	97·38
1894	1,109	1,014	2,123	28·29	109·37
1895	1,192	1,181	2,373	26·32	100·93
1896	1,435	1,347	2,782	22·67	106·53
1897	2,036	1,985	4,021	25·85	102·57
1898	2,574	2,394	4,968	29·40	107·52
1899	2,636	2,538	5,174	30·70	103·86
1900	2,789	2,665	5,454	30·80	104·65
1901	2,946	2,772	5,718	30·32	106·28
Total	18,718	17,855	36,573	28·92	104·83

The highest point reached by the birth-rate during the ten years was that attained in 1893, when the rate stood at 34·24 per 1,000 of mean population During each of the three succeeding years a rapid decline was experienced, the lowest rate for the ten years being that recorded for 1896, which amounted to no more than 22·67, or about two-thirds of that for 1893. From 1896 onwards to 1900 a continuous improvement took place, the rate for the latter year reaching 30·80. In 1901 there was a slight decline to 30·32. The rapid fall and subsequent rise in the birth-rate between the years 1893 and 1900 were, of course, due to the variations in the constitution of the population during these years, brought about by migration. The large influx of males during the earlier years increased the mean population on which the rates were based, without exerting a corresponding influence on the number of births. In the later years, the diminution in the stream of male immigration, combined with the advent of the wives of married men and the prospective wives of those who were unmarried, had the effect of causing the rate to gradually rise again.

Digitized by Google

It will be seen from the above table that the female births exceeded the male in only one year out of the ten under review, viz., in the record year of 1893; whilst in the years immediately preceding and succeeding this, the preponderance of male births was exceptionally large. Taking the total births for ten years, it will be noticed that the male births exceeded the female by rather more than 4¾ per cent.

The number of births per 1,000 of the mean population, or what is known as the "crude" birth-rate, is that which is generally given in statistical publications as the birth-rate of any particular community. When referring to the same place for periods not far apart such rates are no doubt useful and comparable, though this is hardly to be expected when the rates of different countries, or of the same country at periods far apart, are compared with a view to ascertaining the relative fecundity. In such cases it is evident that allowance ought to be made for the distribution of population according to age, sex, and conjugal condition. Probably the most correct method of exhibiting the true birth-rate is by what is termed the "refined" birth-rate, namely, that based upon the number of women in the population of child-bearing age, that is between the ages of 15 and 50, the legitimate birth-rate being based upon the number of married, and the illegitimate rate upon the number of unmarried women. The difficulty, however, of obtaining statistics of the ages and conjugal condition of the population for intercensal years prevents this method from coming into general use.

On page 37 will be seen a table giving, for the year 1901, legitimate and illegitimate rates at various ages, based on the results of the Census of 31st March, 1901.

Births in Seasons.

The following table shows the number of births registered quarterly in Western Australia for each of the ten years, 1892 to 1901:—

Year.	Number of Births registered in the Quarter ended on the last day of				Number of Births registered during Year.
	March.	June.	September.	December.	
1892	256	483	531	578	1,848
1893	475	554	581	502	2,112
1894	459	533	574	557	2,123
1895	497	601	681	594	2,373
1896	571	695	761	755	2,782
1897	854	1,019	1,117	1,031	4,021
1898	1,151	1,157	1,392	1,268	4,968
1899	1,227	1,308	1,386	1,253	5,174
1900	1,351	1,402	1,339	1,362	5,454
1901	1,371	1,455	1,538	1,354	5,718
Total	8,212	9,207	9,900	9,254	36,573

From this it will be seen that births are most numerous in the September quarter, and least frequent in that ending 31st March.

Digitized by Google

The following table shows the average number of births registered in each month during the four years, 1898 to 1901 :—

Month.	Average number of Births registered (1898 to 1901.)		
	Males.	Females.	Total.
January	224	210	434
February	204	193	397
March	217	227	444
April	223	210	433
May	227	223	450
June	233	215	448
July	251	234	485
August	245	234	479
September	225	225	450
October	233	213	446
November	237	211	448
December	217	197	414
Total	2,736	2,592	5,328

It will be seen from the above table that July is the month in which births are most numerous, the average for that month for the four years under review being 485. This was closely followed by the August average of 479. May and September, with 450 each (only 6 above the monthly average of 444), came next in order; whilst February, partly on account of its being the shortest month, averages the least, namely, 397. The daily average birth-rate of the State for the four years is 14·60.

Metropolitan and Extra-Metropolitan Birth-rates.

The metropolitan and extra-metropolitan birth-rates for each of the four years, 1898 to 1901, are as follows :—

Year.	Births registered.					
	Perth and Suburbs.		Remainder of State.		The whole State.	
	Number.	Per 1,000 of mean population.	Number.	Per 1,000 of mean population.	Number.	Per 1,000 of mean population.
1898	1,339	37·42	3,629	27·24	4,968	29·40
1899	1,266	36·58	3,908	29·18	5,174	30·70
1900	1,240	35·02	4,214	29·74	5,454	30·80
1901	1,304	35·10	4,414	29·15	5,718	30·32
Total ..	5,149	36·01	16,165	28·85	21,314	30·31

Throughout the period under review the birth-rate of Perth and suburbs has exceeded that of the remainder of the State, the excess

Digitized by Google

per 1,000 of the mean population varying from 10·18 in 1898 to 5·28 in 1900, and averaging 7·16 for the four years.

The excess of the metropolitan over the extra-metropolitan birth-rate is due to various causes, amongst which may be mentioned the age and sex constitution of the respective populations, the existence in Perth of an institution for lying-in cases, and the fact that medical and other attendance are more readily procurable in the city than in some of the outlying districts.

Twins and Triplets.

During the five years, 1897 to 1901, 317 instances of twins and two of triplets were registered in Western Australia. In each of the cases of triplets all three of the children were born alive; but out of the 317 cases of twins no fewer than 26 of the children were still-born, 15 being males and 11 females. The following statement gives the number of cases of twins and triplets which occurred in each of the five years, and the percentage of the mothers who bore more than one child at a birth on the total number giving birth to children during each year:—

Year.	Number of cases.	Number of Live-births.			Percentage on total mothers giving birth to children during year.
		Males.	Females.	Total.	
1897	46	50	38	88	1·16
1898	68	67	64	131	1·39
1899	*68	66	66	132	1·33
1900	64	72	51	123	1·19
1901	73	69	71	140	1·29
Total for 5 years ..	319	324	290	614	1·27

* Including two cases of triplets, comprising four males and two females.

Still-births.

In dealing with statistics of births and deaths, care must be taken to ascertain the manner in which still-births have been treated in their compilation. In England, as is also the case in most of the British possessions, including Western Australia, still-births are excluded from all ordinary returns of births and deaths, whereas on the Continent of Europe, they are in some cases included in both. The registration of still-births is not practised in any of the Australasian States except Western Australia, where they are registered both as births and also as deaths, but, as before stated, are excluded from all returns of births and deaths, except those specially dealing with still-births.

Digitized by Google

The following table shows the number of still-births registered in each of the five years, 1897 to 1901, the percentage of the total number of births (including still) in each case, and also the number of males to each 100 females :—

Year.	Still-births registered.				Number of males to each 100 females.
	Males.	Females.	Total.	Percentage of total births (including still).	
	No.	No.	No.		
1897	55	41	96	2·33	134·15
1898	74	54	128	2·51	137·04
1899	82	77	159	2·98	106·49
1900	97	57	154	2·75	170·18
1901	102	72	174	2·95	141·67
Total	410	301	711	2·73	136·21

It will be seen from the above table that during the five years under review about 2¾ per cent. of the total number of births were still-born cases, the percentage varying from year to year within fairly narrow limits. It will also be noticed that the preponderance of males, which has already been commented on in the case of live-births, is very much more marked amongst the still-born, the males exceeding the females for the five years by more than 36 per cent.

Illegitimacy.

In the following table is shown the number of illegitimate births registered in each of the ten years, 1892 to 1901, the percentage on the total number of births in each case, and the number of males to each 100 females :—

Year.	Males.	Females.	Total.	Percentage on total births.	Number of males to each 100 females.
1892	56	53	109	5·90	105·66
1893	40	48	88	4·17	83·33
1894	48	51	99	4·66	94·12
1895	57	49	106	4·47	116·33
1896	60	96	156	5·61	62·50
1897	114	98	212	5·27	116·33
1898	137	111	248	4·99	123·42
1899	124	130	254	4·91	95·38
1900	143	120	263	4·82	119·17
1901	111	111	222	3·88	100·00
Total ..	890	867	1,757	4·80	102·65

It will be seen from the above table that the number of illegitimate births has varied, during the ten years under review, between the limits of 3¾ and 6 per cent. of the total number registered, the maximum percentage being that of 1892, and the minimum that of 1901. In four out of the ten years the number of female births exceeded the

Digitized by Google

number of males, while in one case the numbers were identical. For the whole period of ten years the male births exceeded the female by rather more than 2½ per cent., as compared with about 4¾ per cent. for all births. It is possible that the number of illegitimate births is somewhat understated in all birth returns, as in such cases there is doubtless often a natural diffidence about proclaiming the fact of illegitimacy; and it is also probable that the bulk of unregistered births would be found to be illegitimate.

The usual method of presenting rates of illegitimacy is that which has been here adopted, viz., as a percentage on the total number of births registered; but it must be admitted that this method hardly gives a correct view of the relative increase or decrease of illegitimacy, since the rate so obtained depends on the fluctuations in the number of legitimate births. If, for instance, the true rate of illegitimacy remained uniform, while a fall was experienced in the legitimate rate, the use of the ordinary method would result in an increased rate of illegitimacy being shown. As before mentioned, the most accurate method of ascertaining the illegitimate rate is that of basing it upon the number of unmarried women of child-bearing age; but the absence of the necessary data for a series of years prevents this method from being generally adopted. For particulars for 1901, see page 37.

In the following table the States of the Commonwealth of Australia and the Colony of New Zealand have been arranged in descending order of the rate of illegitimacy for 1901:—

State or Colony.	Illegitimate Births.	Percentage on total Births.
		%
1.—New South Wales	2,712	7·16
2.—Tasmania	293	5·94
3.—Queensland	848	5·93
4.—Victoria	1,729	5·58
5.—New Zealand	937	4·57
6.—South Australia	361	3·96
7.—Western Australia	222	3·88
Total Australasia ..	7,102	5·75

It is interesting to note that, in the case of illegitimate births, the percentage of still-born is somewhat higher than amongst those that are legitimate, although, as far as the experience of this State extends, the difference is not so marked as might be expected. Thus, for the five years, 1897 to 1901, the figures are as follows:—

Year.	Legitimate Births.				Illegitimate Births.			
	Live-born.	Still-born.	Total.	Percentage of Still-born on total.	Live-born.	Still-born.	Total.	Percentage of Still-born on total.
1897 ..	3,809	93	3,902	2·38	212	3	215	1·40
1898 ..	4,720	117	4,837	2·42	248	11	259	4·25
1899 ..	4,920	148	5,068	2·92	254	11	265	4·15
1900 ..	5,191	144	5,335	2·70	263	10	273	3·66
1901 ..	5,496	165	5,661	2·91	222	9	231	3·90

Digitized by Google

Ante-nuptial Conception.

During the year 1901, out of a total of 5,718 births registered, 1643, or about 29 per cent., were legitimate first-births; and in 413 of these cases the birth of the child occurred within nine months of the date of marriage. The following table gives particulars for 1901, classified according to the period which elapsed between the date of marriage and that of the birth of the first child :—

Period elapsing from date of marriage to birth of first child.	Number of legitimate first births, 1901.
One month and under	8
Over 1 month but not exceeding 2 months ..	7
„ 2 months „ „ 3 „ ..	30
„ 3 „ „ „ 4 „ ..	35
„ 4 „ „ „ 5 „ ..	51
„ 5 „ „ „ 6 „ ..	74
„ 6 „ „ „ 7 „ ..	56
„ 7 „ „ „ 8 „ ..	53
„ 8 „ „ „ 9 „ ..	99
„ 9 „ „ „ 10 „ ..	232
„ 10 „ „ „ 11 „ ..	172
„ 11 „ „ „ 12 „ ..	139
„ 12 „ „ „ 13 „ ..	99
„ 13 „ „ „ 14 „ ..	60
„ 14 „ „ „ 15 „ ..	55
„ 15 „ „ „ 16 „ ..	52
„ 16 „ „ „ 17 „ ..	38
„ 17 „ „ „ 18 „ ..	34
„ 18 „ „ „ 19 „ ..	31
„ 19 „ „ „ 20 „ ..	29
„ 20 „ „ „ 21 „ ..	29
„ 21 „ „ „ 22 „ ..	16
„ 22 „ „ „ 23 „ ..	13
„ 23 „ „ „ 2 years ..	21
Over 2 years but not exceeding 3 „ ..	111
„ 3 „ „ „ 4 „ ..	47
„ 4 „ „ „ 5 „ ..	24
„ 5 „ „ „ 6 „ ..	11
„ 6 „ „ „ 7 „ ..	4
„ 7 „ „ „ 8 „ ..	2
„ 8 „ „ „ 9 „ ..	2
„ 9 „ „ „ 10 „ ..	1
„ 10 „ „ „ 11 „ ..	2
„ 12 „ „ „ 13 „ ..	1
„ 13 „ „ „ 14 „ ..	1
„ 15 „ „ „ 16 „ ..	1
„ 16 „ „ „ 17 „ ..	1
„ 19 „ „ „ 20 „ ..	1
Unspecified	1
Total	1,643

Assuming that all illegitimate births are first-births, and that all births *occurring within nine* months of the date of marriage are the

Digitized by Google

result of ante-nuptial conception, the following results for 1901 are obtained :—

Particulars.	Number.	Percentage on total first births.
First births of post-nuptial conception ..	1,230	65·95
First births ante-nuptial conception ..	413	22·15
First births of illegitimate conception ..	222	11·90
Total, first births ..	1,865	100·00

Ages of Parents.

The ages of the mothers of children whose births were registered during 1901 were as follows :—

Ages.	Mothers of legitimate children.	Mothers of illegitimate children.	Total mothers.
15	1	1	2
16	1	7	8
17	15	11	26
18	43	13	56
19	95	16	111
20	135	13	148
21 and under 25	1,015	59	1,074
25 „ „ 30	1,704	51	1,755
30 „ „ 35	1,397	31	1,428
35 „ „ 40	777	12	789
40 „ „ 45	230	2	232
45 „ „ 50	17	..	17
50 „ „ 55	1	..	1
Not stated	2	2	4
Total	5,433	218	5,651

It will be seen from the above table that out of 218 mothers of illegitimate children, no fewer than 61, or about 28 per cent., were under the age of 21.

The ages of the fathers of illegitimate children are not supplied on the birth certificates; the ages in the case of legitimate births for 1901 were as follows :—

Ages.	Fathers of Legitimate Children.
19	3
20	9
21 years and under 25	316
25 „ „ 30	1,324
30 „ „ 35	1,648
35 „ „ 40	1,187
40 „ „ 45	608
45 „ „ 50	229
50 „ „ 55	60
55 „ „ 60	24
60 „ „ 65	14
65 „ „ 70	6
70 „ „ 75	2
Not stated	3
Total ..	

Digitized by Google

The following table exhibits, for certain groups, the relative ages of the fathers and mothers of children whose births were registered in 1901 :—

Ages.	Ages of Mothers.					Total Fathers.
	Under 21.	21 and under 40.	40 and under 50.	50 and upwards.	Not stated.	
Ages of Fathers: Under 21	9	3	..	..	..	12
21 and under 40	277	4,143	55	..	..	4,475
40 and under 50	4	689	144	..	..	837
50 and upwards	..	57	48	1	..	106
Not stated	..	1	..	..	2	3
Mothers of legitimate children ..	290	4,893	247	1	2	5,433
Mothers of illegitimate children ..	61	153	2	..	2	218
Total Mothers ..	351	5,046	249	1	4	5,651

The following table furnishes for 1901 the number of legitimate births per 1,000 married women in various age-groups, and the number of illegitimate births per 1,000 unmarried women in the same groups. The numbers of the persons whose ages or conjugal condition were unspecified on the Census returns have, for the purposes of this table, been distributed proportionately amongst those specified, a similar course being followed in the case of the number of mothers whose ages were not stated on the registration returns. In the computation of these birth-rates the assumption has been made that, as regards age and conjugal condition, the female mean population for 1901 was distributed in the same proportion as the population enumerated on 31st March, 1901 :—

Age Group.	Legitimate Birth Rate, 1901.	Illegitimate Birth Rate, 1901.
	Number of legitimate births per 1,000 of married female mean population in each age group.	Number of Illegitimate Births per 1,000 of unmarried female mean population in each age group.
15 years and under 21	396·48	9·42
21 " " 25	365·63	17·73
25 " " 30	282·36	18·74
30 " " 35	232·60	22·14
35 " " 40	173·53	15·38
40 " " 45	80·79	3·32
45 " " 50	9·64	..
50 " " 55	0·80	..
Total, 15 years and under 55 ..	209·89	13·36

Taking the Legitimate and Illegitimate births together, the total birth-rate per 1,000 of female mean population between the ages of 15 and 55 *was 153·58.*

Digitized by Google

Australasian Birth-rates.

From the following table, in which the States of the Commonwealth of Australia and the Colony of New Zealand have been arranged in order of the "crude" birth-rates for 1901, it will be seen that Western Australia with 30·32, easily heads the list, the next in order being Tasmania, with 28·40, while South Australia, with 25·16, is the lowest :—

State or Colony.	Births.	
	Number.	Per 1,000 of mean population.
1.—Western Australia	5,718	30·32
2.—Tasmania	4,930	28·40
3.—Queensland	14,303	28·28
4.—New South Wales	37,875	27·60
5.—New Zealand	20,491	26·34
6.—Victoria	31,008	25·78
7.—South Australia	9,111	25·16
Total, Australasia ..	123,436	26·93

B.—Deaths.

Of the three divisions of Vital Statistics, that dealing with Deaths is probably the most important, as showing to a certain extent the effect on the population of the conditions under which they live, and thus suggesting directions in which these conditions may possibly be ameliorated. Of course, conclusions which might legitimately be deduced from mortality statistics in settled communities would be quite untenable in the case of a new country like Western Australia, where the dangers and privations incident to the lives of pioneers, gold prospectors, and miners naturally tend to bring about an exceptionally large number of deaths.

The following table shows the number of deaths registered in Western Australia during each of the ten years, 1892 to 1901, and the death-rates per 1,000 of mean population for males, females, and persons respectively :—

Year.	Males.		Females.		Persons.	
	No.	Per 1,000 of mean Male population.	No.	Per 1,000 of mean Female population.	No.	Per 1,000 of mean population.
1892	621	18·35	310	14·08	931	16·67
1893	647	17·13	298	12·46	945	15·32
1894	755	15·64	326	12·17	1,081	14·40
1895	1,201	20·43	403	12·85	1,604	17·79
1896	1,450	17·63	570	14·10	2,020	16·46
1897	1,825	17·82	818	15·39	2,643	16·99
1898	1,793	16·63	923	15·08	2,716	16·07
1899	1,513	14·39	811	12·80	2,324	13·79
1900	1,487	13·63	753	11·08	2,240	12·65
1901	1,653	14·33	866	11·83	2,519	13·36
Total ..	12,945	16·16	6,078	13·12	19,023	15·05

Digitized by Google

The fluctuations in the death-rate during the ten years have been much more marked amongst the males than amongst the females, the limits of variation for the former being a maximum of 20·43 in 1895, and a minimum of 13·63 in 1900, whilst in the case of the latter a maximum of 15·39 was attained in 1897 and a minimum of 11·08 in 1900. In every year during the ten under review the male death-rate exceeded the female, the excess being greatest in 1895, when it amounted to as much as 7·58, and least in 1898, when it fell to 1·55. The average male death-rate for the ten years exceeded the female by 3·04.

As in the case of births and marriages, the rate generally made use of in connection with Statistics relating to deaths is the "crude" rate, or rate per 1,000 of the total mean population. Since, however, consequent on the well recognised superior longevity of women, which is accounted for by their occupations, habits, and possibly, to some extent constitutional differences, the death-rate is almost invariably higher amongst the males than amongst the females, and varies with age, it is evident that a "crude" rate, which deals only with aggregates and does not take into consideration the "age and sex constitution," that is, the distribution of the population according to sex and age, fails to give a correct view of relative mortality, either of different countries for the same year or of the same country for different years.

In the absence of details as to ages of population, it would, of course, be impossible to use any other than the "crude" rate, or some modification of it, and even when age statistics are available, the "crude" rate possesses, for ordinary uses, the distinct advantage of conveying in one number what would require several numbers to express if rates at various ages for each sex had to be given.

A method has been introduced, however, which combines to some extent the desirable features of both these, the result obtained being the "crude" rate which would exist in some standard population, if the death-rates for various ages found to exist in the population being dealt with had been in operation in the case of the standard population. By this means the conciseness of the "crude" rate is maintained in conjunction with the accuracy of the rate for each age. The rate so obtained is known as the "Index of Mortality."

At the Conference of Australasian Government Statisticians, held at Hobart in January, 1902, it was decided to adopt this method for comparative purposes, and take as a standard the population of Sweden as enumerated at the last Census, namely, that of 1900, the age-grouping to be as follows :—

Under 1 year.
1 to 20 years.
20 to 40 years.
40 to 60 years.
60 and over.

Digitized by Google

As, however, the standard made use of by several European Countries, including Sweden itself, is based upon the results of the Swedish Census of 1890, the Statisticians subsequently agreed to adopt this standard instead of the one based on the most recent Census. The index of mortality for Western Australia for the year 1901, computed on this basis, is as follows :—

Age Groups.	Mean population, 1901.	Number of Deaths, 1901.	Death rate. Number of deaths per 1,000 of Mean Population.	Standard Population. Age distribution per 1,000.	Index of Mortality.
Under 1 year ..	5,152	737	143·05	25·5	3·65
1 year and under 20 ..	62,699	340	5·42	398·0	2·16
20 years and under 40	85,748	636	7·42	269·6	2·00
40 years and under 60	28,849	449	15·56	192·3	2·99
60 and upwards ..	6,155	357	58·00	114·6	6·64
Total	188,603	2,519	13·36	1,000·0	17·44

It will be seen from this table that the index of mortality for 1901 was 17·44, that is to say, had the death-rates, which were experienced in Western Australia in the five specified age-groups been in force in the corresponding age-groups of the standard population, the "crude" rate for that population would have been 17·44, or, to put it somewhat differently, had the mean population of Western Australia for 1901 been distributed, as regards ages, in the same proportion as the standard population, and had the death-rates for the various age-groups been the same as those actually experienced in Western Australia during 1901, the "crude" death-rate for the State would have been 17·44 instead of 13·36.

The index obtained in the manner described is that very generally adopted, but it is not entirely satisfactory, for this reason, that while it makes due allowance for age, none whatever is made for sex-distribution, a somewhat important point considering the marked difference that exists between male and female death-rates. For instance, on computing the index for Western Australia for 1901, so as to allow for sex as well as age distribution, the result obtained is 16·78, as against 17·44, when age distribution only is taken into account, the difference being due to the abnormally large proportion of males in the Western Australian population.

It may be pointed out that, since the computation of the "Index of Mortality," for any year requires the distribution according to age of the population in which the deaths have occurred, and since data relative to ages are available only for Census years, and figures for intercensal years must consequently be estimated, the reliability of the "Index" will be affected by the remoteness of the Census on which such estimated distributions are based.

Digitized by Google

Ages at Death.

The following table shows the number of deaths in various age-groups during 1901 :—

Age Groups.	Males.	Females.	Total.	Percentage of Deaths in each Age Group on Total Deaths.
	No.	No.	No.	%
Under 1 month	133	78	211	8·38
1 month and under 3	63	63	126	5·00
3 months and under 6	92	77	169	6·71
6 " " 12	124	107	231	9·17
Total under 12 months	412	325	737	29·26
1 year and under 2	84	61	145	5·76
2 years and under 3	29	15	44	1·75
3 " " 4	10	11	21	0·83
4 " " 5	5	5	10	0·40
Total, 1 year and under 5 years ..	128	92	220	8·73
5 years and under 10	28	19	47	1·87
10 " " 15	19	13	32	1·27
15 " " 20	20	21	41	1·63
20 " " 25	80	39	119	4·72
25 " " 30	122	52	174	6·91
30 " " 35	112	56	168	6·67
35 " " 40	123	45	168	6·67
40 " " 45	107	36	143	5·68
45 " " 50	94	23	117	4·64
50 " " 55	71	23	94	3·73
55 " " 60	65	25	90	3·57
60 " " 65	63	30	93	3·69
65 " " 70	57	29	86	3·41
70 " " 75	55	10	65	2·58
75 " " 80	37	14	51	2·02
80 " " 85	33	9	42	1·67
85 " " 90	8	4	12	0·48
90 " " 95	1	1	2	0·08
95 " " 100	2	..	2	0·08
Age not stated	16	..	16	0·64
Total, 5 years and over ..	1,113	449	1,562	62·01
Total all ages, Male and Female ..	1,653	866	2,519	100·00

Digitized by Google

Assuming the age distribution for each sex to be the same for the mean population of 1901 as in the case of the population enumerated at the Census taken for the night of 31st March, 1901, and in the cases both of population and deaths, distributing the number of persons of unspecified ages proportionately amongst those specified, the following table furnishes for 1901 the death-rate per 1,000 of the mean population in each age-group :—

Age Group.	Death Rate per 1,000 of mean population in each Age Group.		
	Males.	Females.	Persons.
Under 1 year	156·71	128·81	143·05
1 year and under 5	15·91	11·51	13·72
5 " " 10	3·08	2·09	2·58
10 " " 15	2·48	1·73	2·10
15 " " 20	2·76	3·49	3·09
20 " " 25	6·67	5·21	6·11
25 " " 30	7·64	5·83	7·00
30 " " 35	7·49	7·46	7·48
35 " " 40	9·79	8·22	9·32
40 " " 45	12·18	10·32	11·66
45 " " 50	17·74	10·40	15·59
50 " " 55	20·33	13·33	18·04
55 " " 60	27·84	20·66	25·41
60 " " 65	35·30	32·12	34·22
65 " " 70	51·33	49·49	50·70
70 " " 75	79·21	34·84	66·40
75 " " 80	127·95	102·19	119·82
80 " " 85	230·77	155·17	208·96
85 years and upwards	297·30	192·31	253·97
All ages	14·33	11·83	13·36

Throughout this table, with the single exception of the age-group, "15 years and under 20," the male death-rate exceeds the females, the nearest approach to equality being attained at age "30 years and under 35," with a male rate of 7·49 and a female rate of 7·46

The age-group, "10 years and under 15," is that in which the lowest death-rate was experienced in the cases of both males and females, the respective rates being 2·48 and 1·73.

It is impossible to suggest any suitable explanation for the great excess of mortality of males over females during the earlier years of existence, except it be some as yet unrecognised constitutional difference. After the attainment of adult age, the hardships endured and the risks run, in connection with their ordinary occupations, by a large proportion of males, will, to some extent, account for the higher male death-rate experienced in this period of life, although it must be admitted that in the case of females the dangers connected with child-bearing must in some degree tend to equalise the rates during early and middle adult life.

Digitized by Google

Infantile Mortality.

The rate usually adopted as a measure of infantile mortality for any year is the percentage of the number of deaths of children under one year of age on the number of births recorded during the year. The figures computed on this basis for each of the five years, 1897 to 1901, are as follows; separate rates being shown for males, females, and all children :—

Year.	Infantile mortality (under 12 months).		
	Males.	Females.	All children.
	%	%	%
1897	19·30	17·38	18·35
1898	17·21	15·96	16·61
1899	14·83	13·12	13·99
1900	14·27	10·88	12·61
1901	13·99	11·72	12·89

It will be seen from the above table that the rate of infantile mortality, which in the year 1897 was more than 18 per cent. of the births for the year, gradually diminished during the succeeding years, until in 1900 and 1901 it was less than 13 per cent. The excess of male over female mortality, which in the case of deaths at all ages has already been commented on, will be seen to hold good also in the case of infants, the male rate exceeding the female for each of the five years under review, by quantities varying from 1·25 in 1898 to 3·39 in 1900. The effect produced by the excess of male over female births, noticed on page 29, is thus, to some extent, neutralised by the greater death-rate noticeable during the first year amongst male children.

The principal causes of death of children under the age of 12 months, and the number of deaths due to each cause during the year 1901, and also during the period of five years from 1897 to 1901 are as follows :—

Cause of Death.	Deaths of children under 12 months of age.					
	Year 1901.			Five Years, 1897 to 1901.		
	Males.	Females.	Total.	Males.	Females.	Total.
Diarrhœal Diseases	31	28	59	208	174	382
Premature Birth	54	33	87	276	200	476
Diseases of Respiratory System	35	23	58	150	108	258
Enteritis	100	75	175	415	349	764
Debility, Atrophy, Inanition ..	71	66	137	346	317	663
Other Causes	121	100	221	642	527	1,169
Total	412	325	737	2,037	1,675	3,712

Digitized by Google

The following table gives for each of the five years, 1897 to 1901, the total deaths of children under 12 months from each of the causes specified :—

Cause of Death.	Deaths of children under 12 months of age.					
	1897.	1898.	1899.	1900.	1901.	Five years, 1897 to 1901.
Diarrhœal Diseases	76	105	77	65	59	382
Premature Birth	87	96	112	94	87	476
Diseases of Respiratory System ..	42	52	71	35	58	258
Enteritis	153	176	112	148	175	764
Debility, Atrophy, Inanition ..	134	154	128	110	137	663
Other Causes	246	242	224	236	221	1,169
Total	738	825	724	688	737	3,712

Deaths in Seasons.

The following table shows the number of deaths registered in each Quarter of each of the ten years, 1892 to 1901 :—

Year.	Number of deaths registered in Quarter ended last day of—				Number of deaths registered during Year.	Per 1,000 of mean population.
	March.	June.	September.	December.		
1892 ..	164	283	235	249	931	16·67
1893 ..	223	236	215	271	945	15·32
1894 ..	223	316	237	305	1,081	14·40
1895 ..	416	499	332	357	1,604	17·79
1896 ..	503	607	353	557	2,020	16·46
1897 ..	634	869	501	639	2,643	16·99
1898 ..	790	788	553	585	2,716	16·07
1899 ..	574	678	481	591	2,334	13·79
1900 ..	577	565	464	634	2,240	12·65
1901 ..	572	713	594	640	2,519	13·36
Total ..	4,676	5,554	3,965	4,828	19,023	15·05

The season of the year in which deaths are most numerous is the quarter ending 30th June. Though the number recorded for that quarter has been exceeded on four occasions during the ten years under review, namely, in the March quarters of 1898 and 1900 and the December quarters of 1893 and 1900, the average number of deaths for the ten years registered in the June quarter amounts to 555, as compared with 483 in the December quarter, 468 in the March quarter, and 397 in the September quarter, which is *apparently* the healthiest.

Digitized by Google

The following table shows the average number of deaths registered in each month during the four years, 1898 to 1901 :—

Month.	Average number of deaths registered (1898 to 1901.)		
	Males.	Females.	Total.
January	152	80	232
February	125	72	197
March	129	70	199
April	143	79	222
May	158	87	245
June	146	73	219
July	122	56	178
August	125	63	188
September	103	54	157
October	131	64	195
November	145	67	212
December	133	73	206
Total	1,612	838	2,450

It will be seen from the above that, for the four years under review, the average number of deaths registered attained a maximum in the month of May, in the case of both males and females; whilst the month of September represents the minimum.

Deaths in Public Institutions.

The attached table gives the number of deaths which have occurred in the public institutions of the State during each of the five years, 1897 to 1901, and shows that, whereas in 1897 the percentage of such deaths on the total number of deaths for the year was 25·31, the percentage in 1901 had fallen to 22·31 :—

Year.	Males.	Females.	Total.	Percentage of deaths in Public Institutions on total deaths.
	No.	No.	No.	%
1897	598	71	669	25·31
1898	574	116	690	25·41
1899	440	117	557	23·97
1900	403	95	498	22·23
1901	457	105	562	22·31
Total ..	2,472	504	2,976	23·92

Metropolitan and Extra-Metropolitan Death-rates.

The following table represents an analysis of the deaths during the four years, 1898 to 1901, distinguishing those occurring in Perth and its suburbs, and those occurring elsewhere, and comp

Digitized by Google

relative death-rates of the metropolitan and extra-metropolitan areas of the State :—

Year.	Deaths Registered.					
	Perth and Suburbs.		Remainder of State.		The whole State.	
	Number.	Per 1,000 of mean population.	Number.	Per 1,000 of mean population.	Number.	Per 1,000 of mean population.
1898	739	20·65	1,977	14·84	2,716	16·07
1899	607	17·54	1,717	12·82	2,324	13·79
1900	521	14·72	1,719	12·13	2,240	12·65
1901	622	16·74	1,897	12·53	2,519	13·36
Total ..	2,489	17·41	7,310	13·05	9,799	13·93

In each of the four years under review, the death-rate of Perth and suburbs considerably exceeded that of the remainder of the State, the excess per 1,000 of the mean population varying from 5·81 in 1898 to 2·59 in 1900; while the average for the four years showed an excess of 4·36. The whole of this higher death-rate must not, however, be set down to inferior sanitary conditions, as the age distribution of the population, the existence of numerous public and private institutions for the sick and aged, and the tendency for persons in ill-health to gravitate to the city for nursing and medical attendance, have co-operated to swell the metropolitan death-rate.

Causes of Death.

The system of classification of causes of death adopted in Western Australia is that which was devised by Dr. Ogle, on the basis of a method determined upon by a committee appointed by the Royal College of Physicians, London, and adopted in the Annual Reports of the Registrar General of England since 1881. This system is now made use of, with slight variations, by all the Australian States and the Colony of New Zealand; but owing to the time which has elapsed since it was prepared, and the progress which medical science has made in the meantime, it has been felt that considerable modification might, with advantage, be made in it; and the system of Dr. Bertillon, which has been adopted in France, many of the American States, and also in the Dominion of Canada, has been suggested as a suitable substitute. The question of introducing this system into Australasia was brought under the consideration of the statisticians of the several Australian States at their Hobart Conference of January, 1902, when, although it was generally recognised by them that a revision of the present classification is certainly desirable, it was unanimously decided that the initiation of such a scheme should be left to the mother country, and that, in the meantime, the classification of causes of death to be made throughout the Commonwealth should be that adopted by the Registrar General of England.

Digitized by Google

The following table shows the number of deaths under each class and sub-class of disease for the year 1901 :—

Class and Sub-class.	Causes of Death.	Number of Deaths.			Proportion per cent.
		Males.	Females.	Total.	
Class I. ..	Specific, Febrile, or Zymotic Diseases—				
Sub-class 1 ..	Miasmatic Diseases ..	141	76	217	8·61
Do. 2 ..	Diarrhœal Diseases ..	61	44	105	4·17
Do. 3 ..	Malarial Diseases ..	23	2	25	0·99
Do. 4 ..	Zoogenous Diseases ..	..	..	..	..
Do. 5 ..	Venereal Diseases ..	9	5	14	0·56
Do. 6 ..	Septic Diseases	8	25	33	1·31
Total, Class I.	.. ..	242	152	394	15·64
Class II. ..	Parasitic Diseases	7	1	8	0·32
Class III. ..	Dietetic Diseases	37	13	50	1·99
Class IV. ..	Constitutional Diseases ..	188	122	310	12·31
Class V. ..	Developmental Diseases ..	110	63	173	6·87
Class VI. ..	Local Diseases:—				
Sub-class 1 ..	Diseases of the Nervous System	112	69	181	7·19
Do. 2 ..	Diseases of the Organs of Special Sense ..	2	2	4	0·16
Do. 3 ..	Diseases of the Circulatory System	135	49	184	7·30
Do. 4 ..	Diseases of the Respiratory System	200	65	265	10·52
Do. 5 ..	Diseases of the Digestive System	226	163	389	15·44
Do. 6 ..	Diseases of the Lymphatic System and Ductless Glands	1	1	2	0·08
Do. 7 ..	Diseases of the Urinary System	45	17	62	2·46
Do. 8 ..	Diseases of the Organs of Generation	..	4	4	0·16
Do. 9 ..	Diseases of Parturition ..	..	19	19	0·75
Do. 10 ..	Diseases of the Organs of Locomotion	3	1	4	0·16
Do. 11 ..	Diseases of the Integumentary System ..	1	2	3	0·12
Total, Class VI.	.. ..	725	392	1,117	44·34
Class VII. ..	Violence:—				
Sub-class 1 ..	Accident or Negligence ..	202	34	236	9·37
Do. 2 ..	Homicide	6	..	6	0·24
Do. 3 ..	Suicide	34	6	40	1·58
Do. 4 ..	Execution	..	..	..	..
Total Class VII.	.. ..	242	40	282	11·19
Class VIII. ..	Ill-defined or not specified causes	102	83	185	7·34
Total, all causes	.. ..	1,653	866	2,519	100·00

Digitized by Google

The next table gives a summary of the causes of death of persons of both sexes, as registered during each of the ten years, 1892 to 1901:—

Class.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.		
										Males.	Females.	Total.
I.—Specific Febrile, or Zymotic Diseases	178	146	168	503	586	678	676	431	363	242	152	394
II.—Parasitic Diseases	1	1	..	..	..	8	4	3	11	7	1	8
III.—Dietetic Diseases	..	10	16	30	31	47	53	51	47	37	13	50
IV.—Constitutional Diseases	90	75	89	115	145	188	214	226	246	188	122	310
V.—Developmental Diseases	80	66	93	100	125	171	163	198	176	110	63	173
VI.—Local Diseases	353	429	467	574	750	1,069	1,159	968	996	725	392	1,117
VII.—Violence	92	102	109	123	155	255	230	290	264	242	40	282
VIII.—Ill-defined and not specified Causes	137	116	139	159	228	227	217	157	137	102	83	185
Total	931	945	1,081	1,604	2,020	23,64	2,716	2,324	2,240	1,653	866	2,519

Digitized by Google

The heavy death-rate in Class I., for the years 1895 to 1898, was mainly due to the prevalence of typhoid fever, the number of deaths from which increased from 28 in 1893 to 400 and 407 in 1897 and 1898, respectively; but has fallen again to 120 for 1901. In Class VI., from 1897 to 1901, there has been a considerable increase in the number of deaths from pneumonia, which, during that period, averaged 157 per annum, as compared with a total of 34 in 1892; whilst from 11 deaths from enteritis, in 1893, a maximum of 245 was reached in 1898, the number falling to 165 in the following year, but gradually rising again to 238 in 1901, and averaging 196 per annum for the final six years of the decade.

In the following table the principal or more important causes of the deaths registered during 1901 have been arranged in order of fatality; and the percentage of the number of deaths from each cause on the total number for the year has also been given:—

	Cause of Death.	Deaths registered.	
		No.	Percentage on total deaths.
1.	Enteritis	238	9·45
2.	Accidental Death	236	9·37
3.	Pneumonia	166	6·59
4.	Debility, Atrophy, Inanition	161	6·39
5.	Phthisis	151	5·99
6.	Typhoid (Enteric Fever)	120	4·76
7.	Premature Birth	87	3·45
8.	Cancer	83	3·29
9.	Heart Disease (undefined)	77	3·06
10.	Old Age	70	2·78
11.	Bronchitis	66	2·62
12.	Diarrhœa	66	2·62
13.	Endocarditis, Valvular Disease	50	1·98
14.	Measles	45	1·79
15.	Inflammation of the Brain or its Membranes	41	1·63
16.	Suicide	40	1·59
17.	Diseases of Nervous System (undefined)	37	1·47
18.	Dysentery	35	1·39
19.	Syncope	32	1·27
20.	Tubercular Meningitis	29	1·15
21.	Convulsions	29	1·15
22.	Diseases of Stomach (undefined)	29	1·15
23.	Bright's Disease (Nephria)	27	1·07
24.	Starvation, Want of Breast Milk	26	1·03
25.	Dentition	23	0·91

Digitized by Google

Typhoid fever, which for some years occupied the chief position in the list of fatal diseases in Western Australia, had in the year 1901 dropped down to sixth place, and was responsible for only 4¾ per cent. of the total deaths of the year, as against 20 per cent. in 1895 and 1896, 15 per cent. in 1897, and 11 per cent. in 1898. Enteritis being principally an infantile complaint, the large number of deaths appearing under this head is chiefly owing to the increased birth-rate experienced during recent years; thus, of the 238 deaths due to enteritis no fewer than 214 were cases of children under 5 years of age, and of these 175 were under 12 months. Of the cases classed as "Debility, Atrophy, Inanition," 137 out of the total of 161 were deaths of children under 12 months, while, of the remaining 24, 17 were between the ages of 1 and 5.

Typhoid Fever.—Out of the total of 217 deaths from miasmatic iseases which occurred during 1901, 120, or rather more than half, were due to typhoid fever. This disease, which, during the ten years, 1892 to 1901, was responsible for 1,980 deaths in Western Australia out of a total of 19,023, or rather more than 10 per cent., was almost unknown in this State prior to 1894, when the great rush to the then newly discovered goldfields may be said to have fairly set in. From the following table it will be seen that the ravages of the disease have now been greatly checked by the increased and increasing sanitary precautions taken in all parts of the State. The number of deaths from typhoid in 1901 was the lowest recorded for any year since 1894:—

Year.	Deaths from Typhoid Fever.		Percentage on total deaths.
	Number.	Per 1,000 of mean population.	
1892	55	0·98	5·91
1893	28	0·45	2·96
1894	73	0·97	6·75
1895	325	3·60	20·26
1896	400	3·26	19·80
1897	407	2·62	15·40
1898	296	1·75	10·90
1899	148	0·88	6·37
1900	128	0·72	5·71
1901	120	0·64	4·76

It will also be noticed that, whilst the largest number of deaths from typhoid fever in any one year was the 407 recorded in 1897, the highest death-rate per 1,000 of the mean population, and also the greatest percentage on total deaths, were those experienced in 1895. From 3·60, in the latter year, the death-rate continuously declined, until in 1901 it stood at 0·64, the lowest rate, except that for 1893, recorded during the ten years. The percentage on total deaths also fell from 20·26 in 1895 to 4·76 in 1901.

Digitized by Google

Diarrhœal Diseases.—Under this head are included cholera (sporadic, simple), diarrhœa and dysentery. The following table shows the mortality from these diseases during the ten years, 1892 to 1901 :—

Year.	Deaths from Diarrhœal Diseases.		Percentage on total deaths.
	Number.	Per 1,000 of Mean population.	
1892	71	1·27	7·63
1893	48	0·78	5·08
1894	62	0·83	5·74
1895	104	1·15	6·48
1896	129	1·05	6·39
1897	164	1·05	6·21
1898	235	1·39	8·65
1899	149	0·88	6·41
1900	117	0·66	5·22
1901	105	0·56	4·17

The death-rate from diarrhœal diseases attained its maximum for the ten years in 1898, when it amounted to 1·39 per 1,000 of the mean population, the percentage on total deaths being 8·65. Since then a continuous decline, both in number, rate, and percentage, has taken place, the figures for 1901—105, 0·56, and 4·17, respectively –the minimum for the decade, being less than half of those for 1898.

Cancer.—This terrible disease, which, throughout the world, appears to be claiming an ever increasing number of victims from year to year, was responsible in 1901 for 83 deaths, the largest number recorded in Western Australia in any one of the past ten years. The variation in the death-rate from this cause during the past decade is, however, of such a nature that, as far as the experience of this State is concerned, the disease cannot be definitely said to be on the increase. The following table gives particulars for the ten years, 1892 to 1901 :—

Year.	Deaths from Cancer.		Percentage on total deaths.
	Number.	Per 1,000 of Mean population.	
1892	16	0·29	1·72
1893	19	0·31	2·01
1894	22	0·29	2·04
1895	25	0·28	1·56
1896	30	0·24	1·49
1897	51	0·33	1·93
1898	55	0·33	2·03
1899	60	0·36	2·58
1900	52	0·29	2·32
1901	83	0·44	3·29

Digitized by Google

It will be noticed, with regret, that the death-rate, and also the percentage on total deaths, for the final year, 1901, were higher than in any other of the ten years; the lowest death-rate being 0·24 per 1,000 of mean population, for 1896.

Phthisis.—The *number* of deaths annually from phthisis has unfortunately, during the past ten years, been steadily increasing, but, as the population has in the same time more than trebled itself, and as many people suffering from this disease in very advanced stages visit Australasia for the sake of their health, and of a possible recovery, a much larger numerical increase than has actually been experienced might reasonably have been expected. Particulars for the ten years, 1892 to 1901, are as follows:—

Year.	Deaths from Phthisis.		Percentage of total deaths.
	Number.	Per 1,000 of Mean population.	
1892	47	0·84	5·05
1893	44	0·71	4·66
1894	53	0·71	4·90
1895	57	0·63	3·55
1896	83	0·68	4·11
1897	87	0·56	3·29
1898	113	0·67	4·16
1899	114	0·68	4·91
1900	137	0·77	6·12
1901	151	0·80	5·99

The phthisis death-rate for 1901, viz., 0·80 per 1,000 of mean population, was the highest experienced in any of the ten years, except 1892, when a rate of 0·84 was recorded. The lowest rate for the period was that of 1897, viz., 0·56, the rates for subsequent years exhibiting a continuous increase

Diseases of the Respiratory System.—The principal ailments included under this head are pneumonia, bronchitis, and congestion of the lungs. Diseases of the respiratory system have been responsible during the ten years, 1892 to 1901, for no fewer than 2,041 deaths, of which 1,090, or rather more than half, were due to pneumonia, whilst of the remainder bronchitis claimed 527, and congestion of the lungs 121.

Digitized by Google

Particulars for each of the ten years are as follows :—

Year.	Diseases of the Respiratory System.		Percentage on Total Deaths.
	Number.	Per 1,000 of Mean Population.	
1892	115	2·06	12·35
1893	140	2·27	14·81
1894	145	1·93	13·41
1895	191	2·12	11·91
1896	176	1·43	8·71
1897	242	1·56	9·16
1898	281	1·66	10·35
1899	259	1·54	11·14
1900	227	1·28	10·13
1901	265	1·41	10·52

The greatest number of deaths from respiratory diseases in any one of the ten years was 281, recorded in 1898, in which year the rate per 1,000 of mean population was 1·66. The highest death-rate for the period was that of 1893, viz., 2·27. It is of interest to note, also, that, as regards this death-rate, the ten years are divided into two distinct sections, 1892–5 and 1896–1901, the rates in the former section being on a somewhat higher level throughout than those in the latter.

Deaths due to Child-birth.—During the year 1901, 28 deaths of women from diseases incidental to child-birth were recorded. Details for the five years, 1897 to 1901, are as follows :—

Particulars.	1897.	1898.	1899.	1900.	1901.
Abortion, Miscarriage	1	3	3	3	8
Puerperal Mania	1	1	..	1	..
Puerperal Convulsions	1	1	7	3	5
Puerperal Fever	6	11	7	16	9
Placenta Prævia (Flooding).. ..	1	1	1	3	2
Phlegmasia Dolens	..	..	1	..	..
Other Accidents of Child-birth ..	12	9	8	13	4
Total Deaths	22	26	27	39	28
Number of Confinements	4,071	5,028	5,263	5,544	5,819
Number of Deaths in Child-birth per 1,000 Confinements ..	5·40	5·17	5·13	7·03	4·81

The number of confinements used in the above table has been obtained from the total number of births (live and still) for each year by deducting one from each in the case of twins and two for each case of triplets recorded. It is evident that in the case of all such diseases as are incidental to child-birth a rate based on the number of confinements gives far more accurate results for comparative purposes than one based on the total of the mean population.

Google

Accidents.—The increased employment of labour during recent years in the mining, timber, and other industries of the State, and also on railways and other public works, has naturally led to an increase in the number of accidental deaths. The mortality from these causes during the past ten years is as follows :—

Year.	Deaths from Accident or Negligence.		Percentage on total Deaths.
	Number.	Per 1,000 of Mean Population.	
1892	74	1·33	7·95
1893	89	1·44	9·42
1894	88	1·17	8·14
1895	95	1·05	5·92
1896	128	1·04	6·34
1897	211	1·35	7·98
1898	196	1·16	7·22
1899	249	1·48	10.71
1900	216	1·22	9·64
1901	236	1·25	9·37

During the ten years no fewer than 1,582 accidental deaths were recorded, the most fatal year being 1899, when the total amounted to 249, and the rate per 1,000 of mean population to 1·48. It will be seen that of the total deaths for the past three years about 10 per cent. have been due to accidents or negligence.

In the following table the total number of deaths from each specified kind of accident during the ten years is shown, and also the percentage which the number of deaths from each cause bears to the total number of accidental deaths :—

Nature of Accident.	Accidental Deaths during the ten years—1892–1901.	
	Number.	Percentage on total Accidental Deaths.
Fractures, Contusions	659	41·66
Gunshot Wounds	42	2·65
Cuts, etc.	45	2·84
Burn, Scald	171	10·81
Sunstroke	126	7·96
Lightning	5	0·32
Poison	58	3·67
Bite of Snake or Insect	2	0·13
Drowning	303	19·15
Suffocation	81	5·12
Otherwise	90	5·69
Total	1,582	100·00

Digitized by Google

Suicide.—Out of 282 violent deaths in Western Australia during 1901, 40 were cases of suicide, the largest number recorded in the State for any single year. The mortality from this cause during the ten years, 1892 to 1901, was :—

Year.	Suicides.		Percentage on total Deaths.
	Number.	Per 1,000 of Mean Population.	
1892	11	0·20	1·18
1893	13	0·21	1·38
1894	17	0·23	1·57
1895	26	0·29	1·62
1896	25	0·20	1·24
1897	35	0·22	1·32
1898	30	0·18	1·10
1899	32	0·19	1·38
1900	35	0·20	1·56
1901	40	0·21	1·59

Out of the 264 suicidal deaths which have occurred during the ten years, although the greatest number in one year was that recorded in 1901, the largest death-rate per 1,000 of mean population from this cause (0·29) was experienced in 1895, the lowest (0·18) being that for 1898. From the latter year onward a slight but steady increase in the rate has taken place. Considering the nature of this cause of death and the comparative smallness of the numbers involved, the evenness of the number of cases, and the regularity in the death-rate for the ten years, which averages 0·21 per annum per 1,000 of mean population, is somewhat remarkable.

The number of deaths resulting during the ten years, 1892 to 1901, from each of the different methods employed in committing suicide, is shown in the following table, and also the percentage of the number under each head on the total number for the period. It will be seen that during that time 264 persons committed suicide, and that by far the most common method of self-destruction was by shooting, 89 cases, or nearly 34 per cent., of the total number being recorded as due to "gunshot wounds," which, of course, includes wounds caused by firearms of any description :—

Cause of Death.	Suicides during the ten years, 1892 to 1901.	
	Number.	Percentage on total Suicides.
Gunshot Wounds	89	33·71
Cut, Stab	47	17·80
Poison	44	16·67
Drowning	14	5·30
Hanging	35	13·26
Otherwise	35	13·26
Total	264	100·00

Digitized by Google

Australasian Death Rates.

The following table gives the various States of the Commonwealth and the Colony of New Zealand, arranged in ascending order of death-rates, for 1901. The lowest death-rate for the year was 9·81 per 1,000 of mean population, experienced in New Zealand, while Tasmania, with 10·40, occupied second place, the highest rate being, unfortunately, that of Western Australia, viz., 13·36, which differed, however, only slightly from the 13·22 recorded in Victoria :—

State or Colony.	Deaths, 1901.	
	Number.	Per 1,000 of Mean Population.
1. New Zealand	7,634	9·81
2. Tasmania	1,805	10·40
3. South Australia	4,065	11·22
4. New South Wales	16,021	11·68
5. Queensland	6,007	11·88
6. Victoria	15,904	13·22
7. Western Australia	2,519	13·36
Total Australasia ..	53,955	11·77

(C.)—Marriages.

A high marriage rate is generally looked upon as one of the surest signs of prosperity, since in bad times people are usually not so readily prepared to undertake the responsibilities attaching to the married state. Viewed from this standpoint, Western Australia would appear to be by far the most prosperous State of the Australasian group, or at any rate to have held out during recent years the brightest prospects for the future ; for during the years 1894 to 1901, the marriage rate has been considerably higher than that of any of the other States. Allowance must be made, however, for the abnormal nature of the population of Western Australia as regards age distribution, and also probably as regards the relative proportions of married and single. A very large proportion of single men in the population would naturally tend, as they began to settle down and make homes for themselves, to cause an increase in the marriage rate, and the high rate experienced in Western Australia during the past five years is probably due to a large extent to this cause.

The marriage rate is usually expressed in number per 1,000 of the mean population, but this rate is hardly satisfactory for the purpose of comparison. The proper basis on which to calculate marriage rates would undoubtedly be the number of eligible persons, that is, the number of persons over the age, say, of 15, who are either single, widowed, or divorced. As already remarked in the case of births, the difficulty of obtaining, for a series of years, reliable figures for such a basis, has prevented this more correct marriage rate from *taking the place of the* "crude rate" in statistical publications.

Digitized by Google

On page 62, will be found a table giving, for the year 1901, marriage rates at various ages based on the results of the Census of 31st March, 1901.

The number of marriages registered in Western Australia during each of the ten years, 1892 to 1901, is given in the following table, and also the rate per 1,000 of mean population. From this table it will be seen that the marriage rate attained its maximum for the ten years in 1897, the rate for that year being the extraordinarily high one of 10·66. Since then, although a slight fall has been experienced, the rate has been fairly well maintained, and in 1901, when the lowest point for the five years, 1897–1901, was reached, the rate still stood as high as 9·66.

Year.	Marriages.	
	Number.	Per 1,000 of mean population.
1892	412	7·38
1893	392	6·35
1894	482	6·42
1895	633	7·02
1896	1,077	8·78
1897	1,659	10·66
1898	1,674	9·91
1899	1,671	9·92
1900	1,781	10·06
1901	1,821	9·66
Total ..	11,602	9·18

Marriages in Seasons.

The following table gives the number of marriages registered in each quarter of each of the five years, 1897 to 1901 :—

Year.	Number of Marriages registered in Quarter ended last day of:				Number of Marriages registered during the year.
	March.	June.	September.	December.	
1897	340	362	456	501	1,659
1898	326	478	446	424	1,674
1899	362	452	420	437	1,671
1900	407	490	447	437	1,781
1901	412	519	429	461	1,821
Total ..	1,847	2,301	2,198	2,260	8,606

The Quarter ended 30th June is that in which marriages are most numerous, the average registrations in that quarter for the five years, 1897 to 1901, being 460, as against 452, 440, and 369 in the December, September, and March quarters, respectively. In only one year out of the five under review, viz., in 1897, was the record for the June *quarter exceeded.*

Digitized by Google

The following table shows the average number of marriages registered in each month during the four years 1898 to 1901 :—

Month.	Average number of marriages registered (1898 to 1901)
January	128
February	135
March	114
April	168
May	162
June	155
July	133
August	152
September	151
October	140
November	140
December	159
Total	1,737

It will be seen that the months of April and May are those in which marriages are most numerous, their respective averages for the four years being 168 and 162, whilst the month of March, with an average of 114, is that in which fewest marriages take place. The lowness of the March record is, to a large extent, probably due to the fact that Lent, which by some denominations is regarded as a season of abstention from marriage, occurs in March. Marriages, therefore, which in the ordinary course would have occurred in March are thus deferred to the succeeding months, thereby increasing the totals for April and May.

Metropolitan and Extra-Metropolitan Marriage Rates.

The attached table furnishes a comparison of the marriage rates of the Metropolitan and Extra-Metropolitan Districts of Western Australia for each of the four years 1898 to 1901 :—

Year.	Marriages registered.					
	Perth and Suburbs.		Remainder of State.		The whole State.	
	Number.	Per 1,000 of mean population.	Number.	Per 1,000 of mean population.	Number.	Per 1,000 of mean population.
1898	588	16·43	1,086	8·15	1,674	9·91
1899	482	13·93	1,189	8·88	1,671	9·92
1900	531	15·00	1,250	8·82	1,781	10·06
1901	573	15·42	1,248	8·24	1,821	9·66
Total ..	2,174	15·19	4,773	8·52	6,947	9·88

For each of the years under review the marriage rate of Perth and suburbs has greatly exceeded that of the remainder of the State, the excess in the average rate for the four years being no less than 6·67 per 1,000 of mean population. This higher marriage rate of the Metropolis may be accounted for partly by the age and sex constitution of the respective populations, partly by the conditions of city life

Digitized by Google

being more conducive to matrimonial alliance, and partly by the fact that many couples usually residing outside the metropolis proceed thither to be married, thereby increasing the Metropolitan and decreasing the Extra-Metropolitan marriage rate.

Mark Signatures.

Shortly after the inauguration of civil registration in England, Dr. Farr introduced in the returns, issued by the Registrar General, columns showing the number of cases in which one or both of the contracting parties signed the marriage register with a mark, the object he had in view being to ascertain by a comparison of the ratio which the number of mark signatures bore to the total number of marriages from year to year, the variation in the elementary education of the people. Similar returns are prepared in the Australian States, and the Colony of New Zealand, and the results in Western Australia for the eight years 1894–1901 are as follows :—

Year.	Males.		Females.		Persons.	
	Number.	Percentage of Males married.	Number.	Percentage of Females married.	Number.	Percentage of Persons married.
1894 ..	10	2·07	10	2·07	20	2·07
1895 ..	12	1·90	13	2·05	25	1·97
1896 ..	33	3·06	31	2·88	64	2·97
1897 ..	14	0·84	21	1·27	35	1·05
1898 ..	10	0·60	24	1·43	34	1·02
1899 ..	15	0·90	22	1·32	37	1·11
1900 ..	20	1·12	23	1·29	43	1·21
1901 ..	18	0·99	18	0·99	36	0·99

Celebration of Marriages.

In the following table the number of marriages celebrated during 1900 and 1901 by Ministers of the various denominations and by District Registrars is shown, and also, in each case, the percentage on the total number of marriages :—

Denomination, etc.	1900.		1901.	
	Number.	Percentage.	Number.	Percentage.
Church of England	558	31·33	596	32·73
Roman Catholic	334	18·75	336	18·45
Wesleyan Methodist	399	22·40	379	20·81
Presbyterian	154	8·65	169	9·28
Congregational	88	4·94	75	4·12
Salvation Army	9	0·50	15	0·82
Baptist	28	1·57	39	2·14
Church of Christ	14	0·79	16	0·88
Seventh Day Adventist	1	0·06	2	0·11
Lutheran	..	..	1	0·06
Hebrew	6	0·34	1	0·06
Mahomedan	..	..	1	0·06
District Registrars	190	10·67	191	10·48
Total	1,781	100·00	1,821	100·00

Digitized by Google

It may be of interest to note that the percentage shown above cannot be taken as giving even a rough approximation to the proportion of the whole population belonging to each denomination, since it has been found, where comparison was possible, that the two differ materially. The following table shows the number of persons returned at the Census taken on 31st March, 1901, as belonging to each of the denominations specified, and a comparison of the percentages on total population with those given above for 1901 in the table relating to marriages shows that the number of adherents of some of the denominations was altogether out of proportion to the number of marriages performed by their ministers during the year :—

Denomination.	Adherents at date of Census, 31st March, 1901.	
	Number.	Percentage on total specified.
Church of England	75,654	42·02
Methodist	24,540	13·63
Presbyterian	14,707	8·17
Congregational	4,404	2·45
Baptist	2,914	1·62
Church of Christ	1,045	0·58
Salvation Army	1,690	0·94
Lutheran	1,703	0·94
Seventh Day Adventist	211	0·12
Unitarian	150	0·08
Protestant (undefined)	1,847	1·03
Roman Catholic	40,584	22·54
Greek Catholic	172	0·09
Catholic (undefined)	1,309	0·73
Other Christians	561	0·31
Hebrew	1,259	0·70
Mahomedan	1,191	0·66
Others, specified	6,104	3·39
Total specified	180,045	100·00
Object to state and unspecified ..	4,079	..
Total ..	184,124	..

Ages at Marriage.

The following table shows the mean of the recorded ages at marriage of all persons whose marriages were registered in each of the four years 1898 to 1901 :—

Year.	Mean of the recorded ages at marriage.		Mean Excess of Husband's age over Wife's.
	Husbands.	Wives.	
1898	28·96	25·01	3·95
1899	29·19	25·13	4·06
1900	29·12	24·99	4·13
1901	29·43	25·31	4·12

It will be seen from the above table that, as far as can be ascertained from the information available, there is in Western Australia

Digitized by Google

a tendency for the average age at marriage, both of husbands and wives, to increase, and also, though to a smaller extent, for the difference between the ages of the parties to increase. An experience limited to four years is, however, too restricted to allow of any trustworthy conclusions as to the tendency being drawn.

The following table furnishes details respecting the ages at the time of marriage of wives and husbands whose marriages were registered during 1901 :—

Ages.	Wives.	Husbands.
15	1	..
16	6	..
17	43	..
18	78	4
19	91	9
20	119	17
21 and under 25	621	330
25 „ 30	523	734
30 „ 35	210	400
35 „ 40	78	204
40 „ 45	25	69
45 „ 50	16	27
50 „ 55	6	18
55 „ 60	2	4
60 „ 65	2	2
65 „ 70	..	..
70 „ 75	..	1
75 „ 80	..	2
Total ..	1,821	1,821

The following table gives for certain groups the relative ages of husbands and wives whose marriages were registered during 1901 :—

Ages of Husbands.	Ages of Wives.				Total Husbands.
	Under 21	21 and under 40.	40 and under 50.	50 and upwards.	
Under 21	21	9	..	..	30
21 and under 40 ..	313	1,345	10	..	1,668
40 „ 50 ..	4	65	25	2	96
50 and upwards ..	..	13	6	8	27
Total Wives ..	338	1,432	41	10	1,821

It will be observed from the foregoing tables that out of 1,821 females married, as many as 338, or about 18½ per cent., were under the age of 21, whilst in the case of males only 30 or less than 1¾ per cent. were minors, and of these no fewer than 21 married wives who were also minors. In 1,345 cases, or about 74 per cent. of the total of 1,821, both the contracting parties were between the ages of 21 and 40.

Digitized by Google

The following table furnishes particulars relative to the marriages of minors for each of the five years 1897 to 1901 :—

Year.	Marriages of Minors.					
	Males.	Females.	Total.	Percentage of Minors married on total number married.		
				Males.	Females.	Persons.
	No.	No.	No.	%	%	%
1897	15	258	273	0·90	15·55	8·23
1898	15	301	316	0·90	17·98	9·44
1899	20	324	344	1·20	19·39	10·29
1900	33	356	389	1·85	19·99	10·92
1901	30	338	368	1·65	18·56	10·10
Total	113	1,577	1,690	1·31	18·32	9·81

On the assumption that the distribution as regards age and conjugal condition of the population enumerated at the Census of 31st March, 1901, will apply to the mean population for 1901, and allowing on the lines mentioned on page 37, for a proportionate distribution of those unspecified on the Census and Registration Returns, the following table shows for various age-groups the number married during the year per 1,000 eligible males and females respectively:—

Age-group.	Male marriage rate 1901.	Female marriage rate, 1901.
	Number of Males married during 1901 per 1,000 of unmarried male mean population in each age-group.	Number of Females married during 1901 per 1,000 of unmarried female mean population in each age-group.
15 years and under 16	..	0·81
16 „ „ 17	..	4·92
17 „ „ 18	..	39·70
18 „ „ 19	2·76	70·02
9 „ „ 20	5·27	90·55
0 „ „ 21	8·67	128·37
1 „ „ 25	35·78	183·46
5 „ „ 30	63·25	184·94
0 „ „ 35	46·92	150·00
35 „ „ 40	33·78	85·71
40 „ „ 45	17·58	41·46
45 „ „ 50	12·53	35·63
50 „ „ 55	12·53	12·58
55 „ „ 60	4·45	4·45
60 „ „ 65	2·44	4·34
65 years and upwards	2·63	..

Conjugal Condition of Contracting Parties.

From the following table, which shows the relative conjugal condition of all persons whose marriages were registered during 1901, it

Digitized by Google

will be seen that out of the total of 1,821 marriages, 1,590, or about 87 per cent., were contracted between bachelors and spinsters :—

Conjugal condition.		Brides.			Total Bridegrooms.
		Spinsters.	Widows.	Divorced.	
Bridegrooms	Bachelors	1,590	101	8	1,699
	Widowers	83	32	3	118
	Divorced	4	..	..	4
	Total Brides ..	1,677	133	11	1,821

The attached table for 1901 gives, for each conjugal condition, the number of marriages per 1,000 of the mean population of such condition :—

Conjugal condition.	Estimated mean population of each conjugal condition for 1901.	Number of marriages during 1901.	Number of marriages per 1,000 of mean population of each conjugal condition.
Males—Bachelors (20 years and upwards)	44,709	1,686	37·71
Widowers	3,015	118	39·14
Divorced	113	4	35·40
Females—Spinsters (17 years and upwards)	12,542	1,670	133·15
Widows	3,202	133	41·54
Divorced	43	11	255·81

The mean ages at marriage for contracting parties of each conjugal condition, in each of the four years 1898 to 1901, were as follows :—

Conjugal condition.	Mean of the recorded Ages at Marriage.			
	1898.	1899.	1900.	1901.
	Years.	Years.	Years.	Years.
Males—Bachelors	28·25	28·43	28·45	28·73
Widowers	39·03	41·30	41·03	39·11
Divorced	41·50	37·40	35·63	40·50
Females—Spinsters	24·23	24·34	24·29	24·41
Widows	34·72	35·27	34·26	36·13
Divorced	35·00	29·57	35·29	30·82

Marriage Law.

No fewer than nine Acts or Amending Acts for regulating the celebration of marriage have at various times been passed by the Legislature of Western Australia, the earliest being that of 1841 (4 and 5 Vict., No. 10). Each of the earlier Acts was repealed by a succeeding one, so that at present there are only two Western Australian Acts in force relating to marriage, viz., 58 Vict., No. 11, in which marriage law was consolidated, and 62 Vict., No. 23, which is

an amendment of the preceding Act, and relates to the marriage of Jews. Two Imperial Acts, however, viz., 5 and 6 Gul. IV., c. 54, and 21 and 22 Vict., c. 93, have also been adopted by the Legislature, the one under 7 Vict., No. 13, the other under 31 Vict., No. 8, and have not since been repealed.

Australasian Marriage Rates.

In the annexed table the various States of the Commonwealth and the Colony of New Zealand have been arranged in order of marriage rates for 1901. Western Australia, with 9·66, is far above any of the others, the next in order being New Zealand, with 7·83, while South Australia, with 6·38, is the lowest:—

State or Colony.	Marriages.	
	Number.	Per 1,000 of mean population.
1. Western Australia	1,821	9·66
2. New Zealand	6,095	7·83
3. Tasmania	1,338	7·71
4. New South Wales	10,538	7·68
5. Victoria	8,406	6·99
6. Queensland	3,341	6·61
7. South Australia	2,309	6·38
Total Australasia ..	33,848	7·39

6.—WESTERN AUSTRALIAN LIFE TABLE.

By Mr. C. H. Wickens, A.I.A., Departmental Actuary, Statistical and Registry Department.

Taking into consideration the importance of a Life Table, whether as an instrument for the computation of the values of payments dependent on the contingencies of human life, or as a means of correctly interpreting the information conveyed by the collected mortality statistics of any country, it is somewhat surprising that throughout Australasia there has, up to the present time, been only one such table officially constructed in connection with the taking of a Census, viz., that of New South Wales for 1891. Several tables of considerable merit have, from time to time, been privately constructed by persons interested in the science of life contingencies, the data being usually those obtained from the Census and registration returns of New South Wales and Victoria, while the figures for Queensland and Tasmania have, on one or two occasions, also been used. New Zealand, too, has had several private or semi-private investigations made concerning her rates of mortality; but, as far as can be ascertained, no such table has ever been compiled on the basis of South Australian experience, and certainly none has ever previously been published relating to Western Australia.

Digitized by Google

The data from which the present Life Table of Western Australia has been compiled are: (1) the mean population for each month of the three years of which the date of the Census (31st March, 1901) occupies the centre, that is, for the three years from 1st October, 1899, to 30th September, 1902; (2) the number of deaths at each integral age which were registered during the same three years; and (3) the age distribution of the population at the date of the Census; sexes being distinguished in each case.

In making use of the Census and registration returns for the purpose of constructing a Life Table, several different methods are open to the compiler. The prevailing tendency in both Census and registration returns for the numbers to preponderate at the quinquennial and decennial ages is well known, and has led in some countries to the tabulation of age particulars for no groups smaller than quinquennial, or even in some cases decennial; details for individual ages being obtained, if required, by some method of interpolation or graduation. In the case of the Western Australian data made use of on the present occasion, the tendency for the figures to cluster at ages which are multiples of 5 was strongly in evidence, and, after careful consideration of the various methods of deducing rates of mortality from the original data, that described in the following pages was adopted, and, judging by the results attained, appears to have worked very satisfactorily.

In both Census and registration returns instances occurred in which the ages had not been specified, though in neither set of returns was the number of such omissions large. In the case of the Census returns, the persons of unspecified age, numbering 315, were, by means of a careful examination of the other particulars specified on the various Schedules, divided into the two classes of adults and children, there being 292 of the former and 23 of the latter. The 292 unspecified adults were then distributed over the ages from 21 to 69, inclusive, in proportion to the numbers actually returned at those ages, the 23 unspecified children being similarly distributed over the ages from 5 to 14, inclusive. In the case of the registration returns, out of a total of 7,475 death registrations (4,928 male and 2,547 female), only 33—29 male and 4 female—were defective as regards age specification. These were proportionately distributed over the ages from 5 upwards, the totals for the several quinquennial age-groups constituting the basis of distribution.

The population on 1st October, 1899, and that at the end of each of the thirty-six months comprised in the period under investigation were obtained by means of the records of births, deaths, arrivals, and departures taken in conjunction with the results of the Census, the monthly mean population being thence deduced by taking for each month half the sum of the population at the beginning and end of such month. These means, on being totalled and divided by twelve, gave the number of years of life spent in the State between 1st October, 1899, and 30th Sep-

Digitized by Google

tember, 1902, amounting to 344,926 years of male and 216,986 of female life The assumption was then made that the age distribution, which had been ascertained at the Census of 31st March, 1901, taken in the centre of this period, would apply to the mean population for the period, and these years of life were distributed over the various ages in proportion to the Census results, as adjusted for unspecified ages.

As the particulars relative to deaths registered during the period were also tabulated for single ages, it will be seen that the data necessary for the computation of the probabilities of life for individual ages were now available. Owing, however, to the comparative paucity of the data, and the tendency before mentioned for accumulations at quinquennial ages, the particulars exhibited considerable irregularity, and it was consequently deemed advisable to adopt some method of grouping before proceeding to compute the required probabilities.

A method sometimes made use of in connection with the construction of Life Tables of this nature is that of deducing from the requisite statistics tabulated in quinquennial or other groups the death rate for each such group, and, on the assumption that the rates so obtained may be taken as those for the central ages in the various groups, of computing, by means of interpolation, particulars for individual ages. Thus, from the number of years of life spent in the age-group say, of "10 and under 15," and the number of deaths occurring therein, the death rate for the group can be computed, and this rate is assumed to be that for age 12—the central age of the group. Similarly the rates for ages 17, 22, 27, etc., are obtained, and the table completed by interpolation.

As, in the present instance, details for individual ages were available both for years of life and for deaths, it appeared desirable to carry this system to its logical conclusion, and, instead of deducing rates for every fifth age in the manner mentioned, to make every age, from 5 years upwards, the central age of a quinquennial group, and thus obtain for each age, without interpolation, an approximate death rate. The work of quinquennial grouping was very simply performed by placing in a column the particulars to be grouped, and then adding them in fives with the help of a slip of paper so cut as to expose, at one time, only the five items to be added together, and to indicate the line in the adjacent column on which the total should be placed.

The rate obtained in the manner described gives, approximately, for each age what is known as the "central death-rate," and denoted by the symbol m_x, being the ratio of the number of deaths between the ages of x and $x + 1$ to the corresponding number of years of life spent between those ages. From this, by means of the formula $p_x = \frac{2 - m_x}{2 + m_x}$, was deduced for each age from 5 upwards the value (ungraduated) of p_x, that is, the probability that a person aged x would live to attain the age $x + 1$.

Digitized by Google

For ages under 5 the method just described is hardly suitable, and the values of p_x for ages 0 to 4, inclusive, were consequently computed by Professor Pell's method, which takes into account the number of births. In the case of the table for males, the junction of the two sets of p_x values was perfectly satisfactory; but in the female table, as the Pell values did not join as smoothly as was to be desired, the value of p_4 was interpolated, the functions used in the interpolation being p_7, p_6, p_5, and p_3. Having, therefore, obtained the values of p_x from age 0 upwards, if any assumed number of children born be inserted in a table against age 0, successive multiplications by the values of p_x will give the number who, out of the assumed number born, will attain each succeeding age, and will thus furnish the column headed l_x in the Life Table. The differences between the successive values in this column evidently give for each age the number who attain that age, but fail to attain the next higher one. These differences form the column "dying," headed d_x in the Life Table.

In the case of all life tables compiled from original observations, it is found necessary to apply to the computed results some method of graduation for the purpose of smoothing out the irregularities which invariably exist in the ungraduated figures, the object aimed at being the introduction of that degree of smoothness in the tables which the uses to which they may be put demand, without at the same time causing the results to differ very materially from those obtained by the original observations.

After consideration of the various graduation methods, it was decided to adopt the well-known one used by Mr. Woolhouse in his graduation of the Institute of Actuaries H^M and other tables, the actual work of graduation being performed by the columnar process. The function operated upon was d_x from age 5 upwards.

The details available for the advanced ages were, however, so meagre that it was considered advisable to complete the table by making use, for this period, of probabilities of life deduced from a more extensive Australian experience, and, consequently, the particulars in the male table from age 72 upwards, and in the female from 64 upwards, have been computed on the basis of the table of Messrs. Moors and Day, compiled from the 1891 Census returns of New South Wales and Victoria, and the death returns for the four years of which that Census date occupied the centre.

From the graduated values of d_x the column l_x was compiled by summation, and the values of p_x were thence derived by means of the formula $p_x = \frac{l_{x+1}}{l_x}$

The column headed q_x furnishes the probability that a person aged x will die before attaining the age $x + 1$. It is the complement of p_x, and is consequently obtained by the formula $q_x = 1 - p_x$.

The following view of the p_x and q_x columns may, perhaps, render their meaning clearer to persons not versed in the technicalities of

Digitized by Google

the life table. At age 50 in the male table, for instance, the value of p_x is ·98233, and that of q_x is ·01767. This may be interpreted as meaning that out of 100,000 males alive on their fiftieth birthday 98,233 will, in any case in which the mortality shown in the table is experienced, live to be 51, while 1,767 will die before attaining that age.

The last column in the table is that which contains what is known as the "expectation of life" or "average after-lifetime," the former being the name most frequently applied to the function, although the latter more accurately expresses its nature. As a misconception of the meaning of the term "expectation of life" appears to be not uncommon, it may be desirable to state here distinctly what is intended to be conveyed by its use. The "expectation of life," at any age, is the number of years which, on the average, will, in accordance with the mortality shown in the particular life table, be subsequently lived by the persons who attain that age. Very few of them will live exactly that number of years; many will live far longer; many others far less; but, taking one with another, the *average* future lifetime or "expectation of life" of those who attain any specified age is that shown against such age in the column headed $\mathring{e}_x$. The formula for the computation of this function is $\mathring{e}_x = \frac{1}{2} + \frac{l_{x+1} + l_{x+2} + l_{x+3} + \text{-----}}{l_x}$. The values were obtained by summing the column l_x from the bottom upwards, so as to show against age x the value of $l_{x+1} + l_{x+2} + \text{-----}$; division by l_x and the addition of $\frac{1}{2}$, in each case, giving the required results.

The various operations involving multiplication and division in the course of the construction of the tables were performed partly by means of logarithms and partly by the arithmometer, Fuller's Spiral Slide Rule being also greatly used, especially for checking purposes.

Western Australian Life Table, 1901 (*Males*).

Age. x	Living. l_x	Dying. d_x	Probability of surviving one year. p_x	Probability of dying in one year. q_x	Complete expectation of life, or average after-lifetime. $\mathring{e}_x$
0	10,000	1,473	·85270	·14730	47·85
1	8,527	300	·96482	·03518	55·03
2	8,227	84	·98979	·01021	56·02
3	8,143	55	·99325	·00675	55·59
4	8,088	34	·99580	·00420	54·97
5	8,054	27	·99665	·00335	54·20
6	8,027	22	·99726	·00274	53·38
7	8,005	20	·99750	·00250	52·52
8	7,985	18	·99775	·00225	51·65
9	7,967	16	·99799	·00201	50·77

Digitized by Google

Western Australian Life Table, 1901 (*Males*)—continued.

Age. x	Living. l_x	Dying. d	Probability of surviving one year. p_x	Probability of dying in one year. q_x	Complete expectation of life, or average after-lifetime. $\mathring{e}_x$
10	7,951	15	·99811	·00189	49·87
11	7,936	15	·99811	·00189	48·97
12	7,921	15	·99811	·00189	48·06
13	7,906	16	·99798	·00202	47·15
14	7,890	18	·99772	·00228	46·24
15	7,872	20	·99746	·00254	45·35
16	7,852	24	·99694	·00306	44·46
17	7,828	28	·99642	·00358	43·60
18	7,800	34	·99564	·00436	42·75
19	7,766	39	·99498	·00502	41·93
20	7,727	45	·99418	·00582	41·14
21	7,682	50	·99349	·00651	40·38
22	7,632	54	·99292	·00708	39·64
23	7,578	57	·99248	·00752	38·92
24	7,521	59	·99216	·00784	38·21
25	7,462	60	·99196	·00804	37·51
26	7,402	59	·99203	·00797	36·81
27	7,343	57	·99224	·00776	36·10
28	7,286	56	·99231	·00769	35·38
29	7,230	54	·99253	·00747	34·65
30	7,176	54	·99247	·00753	33·91
31	7,122	54	·99242	·00758	33·16
32	7,068	56	·99208	·00792	32·41
33	7,012	58	·99173	·00827	31·67
34	6,954	60	·99137	·00863	30·93
35	6,894	62	·99101	·00899	30·19
36	6,832	63	·99078	·00922	29·46
37	6,769	64	·99055	·00945	28·73
38	6,705	65	·99031	·00969	28·00
39	6,640	67	·98991	·01009	27·27
40	6,573	70	·98935	·01065	26·54
41	6,503	74	·98862	·01138	25·82
42	6,429	79	·98771	·01229	25·11
43	6,350	83	·98693	·01307	24·42
44	6,267	86	·98628	·01372	23·74
45	6,181	89	·98560	·01440	23·06
46	6,092	91	·98506	·01494	22·39
47	6,001	93	·98450	·01550	21·72
48	5,908	95	·98392	·01608	21·05
49	5,813	98	·98314	·01686	20·39
50	5,715	101	·98233	·01767	19·73
51	5,614	105	·98130	·01870	19·08
52	5,509	109	·98021	·01979	18·43
53	5,400	115	·97870	·02130	17·79
54	5,285	121	·97711	·02289	17·17
55	5,164	127	·97541	·02459	16·56
56	5,037	133	·97360	·02640	15·97
57	4,904	139	·97166	·02834	15·39
58	4,765	144	·96978	·03022	14·82
59	4,621	147	·96819	·03181	14·27
60	4,474	148	·96692	·03308	13·72
61	4,326	149	·96556	·03444	13·17
62	4,177	151	·96385	·03615	12·62
63	4,026	153	·96200	·03800	12·08
64	3,873	157	·95946	·04054	11·54

Digitized by Google

Western Australian Life Table, 1901 (*Males*)—continued.

Age. x	Living. l_x	Dying. d_x	Probability of surviving one year. p_x	Probability of dying in one year. q_x	Complete expectation of life, or average after-lifetime. $\mathring{e}_x$
65	3,716	163	·95614	·04386	11·00
66	3,553	170	·95215	·04785	10·48
67	3,383	176	·94798	·05202	9·99
68	3,207	182	·94325	·05675	9·51
69	3,025	186	·93851	·06149	9·05
70	2,839	189	·93343	·06657	8·61
71	2,650	191	·92792	·07208	8·19
72	2,459	188	·92355	·07645	7·78
73	2,271	186	·91810	·08190	7·39
74	2,085	184	·91175	·08825	7·00
75	1,901	182	·90426	·09574	6·63
76	1,719	179	·89587	·10413	6·28
77	1,540	175	·88636	·11364	5·95
78	1,365	167	·87766	·12234	5·65
79	1,198	158	·86811	·13189	5·37
80	1,040	146	·85962	·14038	5·11
81	894	133	·85123	·14877	4·86
82	761	119	·84363	·15637	4·62
83	642	106	·83489	·16511	4·38
84	536	94	·82463	·17537	4·15
85	442	82	·81448	·18552	3·93
86	360	71	·80278	·19722	3·71
87	289	61	·78893	·21107	3·50
88	228	51	·77632	·22368	3·30
89	177	42	·76271	·23729	3·10
90	135	34	·74815	·25185	2·91
91	101	27	·73267	·26733	2·73
92	74	21	·71622	·28378	2·54
93	53	16	·69811	·30189	2·35
94	37	12	·67568	·32432	2·15
95	25	9	·64000	·36000	1·94
96	16	6	·62500	·37500	1·75
97	10	4	·60000	·40000	1·50
98	6	3	·50000	·50000	1·17
99	3	2	·33333	·66667	·83
100	1	1	·00000	1·00000	·50

Western Australian Life Table, 1901 (*Females*).

Age. x	Living. l_x	Dying. d_x	Probability of surviving one year. p_x	Probability of dying in one year. q_x	Complete expectation of life, or average after-lifetime. $\mathring{e}_x$
0	10,000	1,206	·87940	·12060	52·99
1	8,794	258	·97066	·02934	59·19
2	8,536	60	·99297	·00703	59·97
3	8,476	44	·99481	·00519	59·39
4	8,432	33	·99609	·00391	58·69
5	8,399	24	·99714	·00286	57·92
6	8,375	19	·99773	·00227	57·09
7	8,356	17	·99797	·00203	56·22
8	8,339	15	·99820	·00180	55·33
9	8,324	13	·99844	·00156	54·43

Digitized by Google

Western Australian Life Table, 1901 (*Females*)—continued.

Age. x	Living. l_x	Dying. d_x	Probability of surviving one year. p_x	Probability of dying in one year. q_x	Complete expectation of life, or average after-lifetime. $\mathring{e}_x$
10	8,311	13	·99844	·00156	53·51
11	8,298	14	·99831	·00169	52·60
12	8,284	16	·99807	·00193	51·68
13	8,268	18	·99782	·00218	50·78
14	8,250	21	·99745	·00255	49·89
15	8,229	24	·99708	·00292	49·02
16	8,205	27	·99671	·00329	48·16
17	8,178	31	·99621	·00379	47·32
18	8,147	34	·99583	·00417	46·50
19	8,113	38	·99532	·00468	45·69
20	8,075	42	·99480	·00520	44·90
21	8,033	44	·99452	·00548	44·13
22	7,989	46	·99424	·00576	43·37
23	7,943	47	·99408	·00592	42·62
24	7,896	47	·99405	·00595	41·87
25	7,849	47	·99402	·00598	41·12
26	7,802	47	·99398	·00602	40·37
27	7,755	47	·99394	·00606	39·61
28	7,708	49	·99364	·00636	38·85
29	7,659	51	·99334	·00666	38·09
30	7,608	53	·99303	·00697	37·34
31	7,555	54	·99285	·00715	36·60
32	7,501	55	·99267	·00733	35·86
33	7,446	56	·99248	·00752	35·12
34	7,390	56	·99242	·00758	34·39
35	7,334	56	·99236	·00764	33·64
36	7,278	57	·99217	·00783	32·90
37	7,221	58	·99197	·00803	32·15
38	7,163	61	·99148	·00852	31·41
39	7,102	64	·99099	·00901	30·68
40	7,038	67	·99048	·00952	29·95
41	6,971	68	·99025	·00975	29·23
42	6,903	69	·99000	·01000	28·52
43	6,834	68	·99005	·00995	27·80
44	6,766	65	·99039	·00961	27·07
45	6,701	62	·99075	·00925	26·33
46	6,639	61	·99081	·00919	25·57
47	6,578	60	·99088	·00912	24·81
48	6,518	61	·99064	·00936	24·03
49	6,457	63	·99024	·00976	23·25
50	6,394	66	·98968	·01032	22·48
51	6,328	70	·98894	·01106	21·71
52	6,258	75	·98802	·01198	20·94
53	6,183	82	·98674	·01326	20·19
54	6,101	89	·98541	·01459	19·46
55	6,012	95	·98420	·01580	18·74
56	5,917	99	·98327	·01673	18·03
57	5,818	102	·98247	·01753	17·33
58	5,716	103	·98198	·01802	16·63
59	5,613	105	·98129	·01871	15·92
60	5,508	111	·97985	·02015	15·22
61	5,397	121	·97758	·02242	14·52
62	5,276	132	·97498	·02502	13·84
63	5,144	143	·97220	·02780	13·18
64	5,001	154	·96921	·03079	12·55

Digitized by Google

Western Australian Life Table, 1901 (*Females*)—continued.

Age. x	Living. l_x	Dying. d_x	Probability of surviving one year. p_x	Probability of dying in one year. q_x	Complete expectation of life, or average after-lifetime. $\mathring{e}_x$
65	4,847	165	·96596	·03404	11·93
66	4,682	176	·96241	·03759	11·33
67	4,506	189	·95806	·04194	10·76
68	4,317	202	·95321	·04679	10·20
69	4,115	215	·94775	·05225	9·68
70	3.900	225	·94231	·05769	9·19
71	3,675	233	·93660	·06340	8·72
72	3,442	238	·93085	·06915	8·28
73	3,204	239	·92541	·07459	7·85
74	2,965	238	·91973	·08027	7·45
75	2,727	235	·91382	·08618	7·05
76	2,492	231	·90730	·09270	6·67
77	2,261	226	·90004	·09996	6·30
78	2,035	220	·89189	·10811	5·94
79	1,815	213	·88264	·11736	5·60
80	1,602	204	·87266	·12734	5·28
81	1,398	193	·86195	·13805	4·98
82	1,205	179	·85145	·14855	4·70
83	1,026	164	·84016	·15984	4·43
84	862	148	·82831	·17169	4·18
85	714	131	·81653	·18347	3·94
86	583	114	·80446	·19554	3·71
87	469	98	·79104	·20896	3·49
88	371	83	·77628	·22372	3·28
89	288	69	·76042	·23958	3·09
90	219	56	·74429	·25571	2·90
91	163	44	·73006	·26994	2·73
92	119	34	·71429	·28571	2·55
93	85	26	·69412	·30588	2·37
94	59	20	·66102	·33898	2·19
95	39	14	·64103	·35897	2·06
96	25	9	·64000	·36000	1·94
97	16	6	·62500	·37500	1·75
98	10	4	·60000	·40000	1·50
99	6	3	·50000	·50000	1·17
100	3	2	·33333	·66667	·83
101	1	1	·00000	1·00000	·50

It will be seen that for all ages the female expectation of life is higher than the male, the difference being 5·14 at birth (age 0), 4·16 at age 1, and at subsequent successive ages a continuously diminishing quantity amounting to 2·75 at age 50 and 0·58 at 70.

An interesting point connected with the relative mortality of males and females disclosed by these tables is the fact that, according to the Western Australian experience, for ages 12 to 17, inclusive, the probability of living a year is greater amongst males than amongst females; this being the only period of life, with the exception of a small portion at advanced ages, at which the male probabilities of living preponderate.

Digitized by Google

In the cases both of the male and of the female table, the probability of surviving a year increases gradually for the first 9 or 10 years, and subsequently decreases with advancing age. In neither table, however, is the decrease absolutely continuous, the male probabilities of living exhibiting a slight increase for ages 26 to 29 inclusive, and the female table for ages 43 to 47, inclusive. From these respective points onwards, the probabilities of living diminish consistently to the end of the tables.

The following table furnishes, for quinquennial ages, a comparison of the expectations of life deduced from the Western Australian experience, with those given in the New South Wales table of 1891 and the English Life Tables Nos. 3 and 5:—

Age.	Expectation of Life. ($\mathring{e}_x$).							
	Western Australian Life Table, 1901.		New South Wales Life Table, 1891.		English Life Table No. 3, 1838–54.		English Life Table No. 5, 1881–90.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
0	47·85	52·99	49·60	52·90	39·91	41·85	43·66	47·18
5	54·20	57·92	54·90	57·42	49·71	50·33	52·75	54·92
10	49·87	53·51	50·89	53·39	47·05	47·67	49·00	51·10
15	45·35	49·02	46·40	48·78	43·18	43·90	44·47	46·55
20	41·14	44·90	42·16	44·46	39·48	40·29	40·27	42·42
25	37·51	41·12	38·16	40·34	36·12	37·04	36·28	38·50
30	33·91	37·34	34·30	36·42	32·76	33·81	32·52	34·76
35	30·19	33·64	30·51	32·64	29·40	30·59	28·91	31·16
40	26·54	29·95	26·84	29·00	26·06	27·34	25·42	27·60
45	23·06	26·33	23·27	25·34	22·76	24·06	22·06	24·05
50	19·73	22·48	19·82	21·61	19·54	20·75	18·82	20·56
55	16·56	18·74	16·58	17·92	16·45	17·43	15·74	17·23
60	13·72	15·22	13·60	14·51	13·53	14·34	12·88	14·10
65	11·00	11·93	10·97	11·41	10·82	11·51	10·31	11·26
70	8·61	9·19	8·64	8·64	8·45	9·02	8·04	8·77
75	6·63	7·05	6·51	6·47	6·49	6·93	6·10	6·68
80	5·11	5·28	5·00	5·04	4·93	5·26	4·52	5·00
85	3·93	3·94	3·44	3·72	3·73	3·98	3·29	3·71
90	2·91	2·90	2·54	2·64	2·84	3·01	2·37	2·75
95	1·94	2·06	..	..	2·17	2·29	1·72	2·05
100	·50	·83	..	..	1·68	1·76	1·24	1·54

It will be seen that, with both male and female expectations of life, the Western Australian experience conforms very closely to that of New South Wales; the male expectation of the latter, and the female expectation of the former, being slightly in excess throughout the greater portion of the tables, the greatest divergence occurring at age 0 in the male tables, where a difference of 1·75 exists.

The expectations of life given by the two Australian tables are for most ages higher than the corresponding values in the two English tables, the difference being most marked amongst females, and at the younger ages in males.

A better idea of the incidence of mortality according to the several tables will, perhaps, be obtained by a comparison of the probabilities of living a year, as given by each table. Such a comparison is fur-

Digitized by Google

nished in the annexed table, which gives for quinquennial ages the probabilities of surviving one year :—

Age.	Probability of surviving one year—(p_x).							
	Western Australian Life Table, 1901.		New South Wales Life Table, 1891.		English Life Table, No. 3, 1838–54.		English Life Table, No. 5, 1881–90.	
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
0	·8527	·8794	·8723	·8888	·8364	·8653	·8390	·8659
5	·9967	·9971	·9941	·9949	·9864	·9867	·9917	·9921
10	·9981	·9984	·9982	·9989	·9944	·9941	·9981	·9983
15	·9975	·9971	·9972	·9977	·9948	·9945	·9971	·9971
20	·9942	·9948	·9955	·9963	·9917	·9914	·9952	·9951
25	·9920	·9940	·9943	·9949	·9908	·9904	·9936	·9938
30	·9925	·9930	·9930	·9937	·9899	·9894	·9917	·9921
35	·9910	·9924	·9916	·9917	·9887	·9884	·9898	·9908
40	·9894	·9905	·9897	·9905	·9870	·9872	·9874	·9895
45	·9856	·9908	·9866	·9897	·9846	·9857	·9844	·9877
50	·9823	·9897	·9838	·9883	·9812	·9838	·9802	·9844
55	·9754	·9842	·9758	·9834	·9755	·9790	·9740	·9791
60	·9669	·9799	·9687	·9755	·9675	·9711	·9641	·9710
65	·9561	·9660	·9512	·9625	·9541	·9589	·9494	·9580
70	·9334	·9423	·9378	·9427	·9327	·9394	·9280	·9378
75	·9043	·9138	·9015	·8985	·9012	·9103	·8954	·9072
80	·8596	·8727	·8690	·8601	·8582	·8698	·8470	·8634
85	·8145	·8165	·7995	·8118	·8029	·8169	·7785	·8040
90	·7482	·7443	·6843	·6650	·7358	·7517	·6877	·7278
95	·6400	·6410	..	..	·6586	·6576	·5767	·6358
100	·0000	·3333	..	..	·5741	·5913	·4523	·5318

PART II.—INTERCHANGE. *

1.—IMPORTS AND EXPORTS.

Compiled from Returns and Information supplied by C. T. Mason, Esq., Collector of Customs.

The trade of the State of Western Australia, which, as will be seen from the following returns, has, during the last decade, increased at an almost phenomenal rate, has, during that period, been chiefly transacted with the following countries:—The United Kingdom, the Commonwealth of Australia, New Zealand, the Straits Settlements, Hong Kong, India, Cape Colony, the United States of America, Germany, and Belgium. During the time mentioned the value of the imports has increased by £5,063,062, and that of the exports by the very respectable sum of £7,633,475, the former being between four and five times, and the latter between nine and ten times as great as they respectively were in the year 1892. Thus, although there has been an enormous advance in the value of the merchandise introduced into the State, the value of the local products exported has increased proportionately to a far greater extent.

* For figures relating to 1902, *see* "Statistical Appendix."

Digitized by Google

Value of Imports into Western Australia from each Country, for each of the Ten Years, 1892–1901.

Country.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.
	£	£	£	£	£	£	£	£	£	£
United Kingdom—Total	592,496	733,001	611,368	943,477	2,057,635	2,624,086	2,051,872	1,550,029	2,225,746	2,566,162
Commonwealth of Australia—										
Victoria	371,829	406,242	842,920	1,883,147	2,428,378	1,719,791	1,431,525	1,175,942	1,195,881	1,275,481
South Australia	246,841	233,764	473,680	667,115	1,203,919	945,380	651,224	670,560	915,845	670,720
New South Wales	34,449	22,424	55,829	147,927	443,341	576,521	637,292	443,436	501,498	526,427
Queensland	479	721	1,109	3,089	6,270	8,705	7,205	8,439	22,120	24,303
Tasmania	819	1,101	72	519	3,077	4,855	7,414	5,467	39,812	62,089
Total Imports from Commonwealth of Australia	654,417	664,252	1,373,610	2,701,797	4,084,985	3,255,252	2,734,660	2,303,844	2,675,156	2,559,020
New Zealand—Total	25,335	748	461	745	20,157	22,048	9,101	8,513	68,346	124,172
Other British Possessions—										
British Columbia	...	708	39	...	...	...	...	...	...	...
Canada	...	...	...	...	...	536	972	5,431	4,370	13,846
Cape Colony	...	...	...	...	...	...	41	166	422	1,086
Ceylon	711	1,535	1,680	1,768	630	3,563	6,119	11,995	15,513	20,327
Gibraltar	...	...	...	14	...	34	...	36	...	...
Hong Kong	79	303	1,863	52	127	1,154	884	1,291	1,191	276
India	313	52	7,513	23,467	33,530	35,362	3,660	4,433	9,456	24,347
Malta	22	...	...	...	...	...	10	...	101	156
Mauritius	16,713	4,577	2,478	526	4,775	6,270	567	791	2,475	963
Natal	...	...	...	...	...	9	...	6	60	185
Singapore	59,413	60,596	48,480	66,235	164,363	163,172	152,870	139,031	245,668	181,327
All other British Possessions ...	7	9	3	..	.	...	...	10	337	3,019
Total Imports from other British Possessions .	77,258	67,780	62,056	92,062	203,425	210,100	165,123	163,190	279,593	245,532

Digitized by Google

Value of Imports into Western Australia from each Country, for each of the Ten Years, 1892-1901—continued.

Country.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.
	£	£	£	£	£	£	£		£	£
Foreign Countries—										
Africa (undefined)	5,776	...	...	...	...	...	...	...	...	...
Belgium	...	...	16,356	1	154	4,131	15,767	28,063	122,873	104,506
China	1,454	290	...	...	1	...	5	59	3	2,027
France	1,524	1,154	3,145	3,858	5,431	12,515	12,717	8,552	7,602	18,970
Germany	243	34	253	7,371	33,293	77,156	130,832	155,927	328,414	264,435
Holland	...	...	32,117	9	...	15	78	24,025	283	1,553
Italy	...	2	185	473	844	3,502	3,251	5,884	12,420	8,316
Norway	...	1,816	...	25	233	13,752	4,921	5,240	171	9,164
Sweden	2,751	...	...	2,046	14,755	35,830	20,654	11,194	10,784	17,575
United States of America ...	29,774	25,170	14,878	23,047	72,077	160,055	91,268	203,777	226,035	507,563
All other Foreign Countries ...	81	191	45	40	567	123	1,716	5,235	4,752	25,180
Total Imports from Foreign Countries	41,603	28,657	66,979	36,870	127,355	307,079	281,209	447,956	713,337	959,285

Summary.

United Kingdom	592,496	733,001	611,308	943,477	2,057,635	2,624,086	2,051,872	1,550,029	2,225,746	2,566,162
Commonwealth of Australia ...	654,417	664,252	1,373,610	2,701,797	4,084,985	3,255,252	2,734,660	2,303,844	2,675,156	2,559,020
New Zealand	25,335	748	461	745	20,157	22,048	9,101	8,513	68,346	124,172
Other British Possessions ...	77,258	67,780	62,056	92,062	203,425	210,100	165,123	163,190	279,593	245,532
Total British	1,349,506	1,465,781	2,047,435	3,738,081	6,366,202	6,111,486	4,960,756	4,025,576	5,248,841	5,494,886
Foreign Countries	41,603	28,657	66,979	36,870	127,355	307,079	281,209	447,956	713,337	959,285
Grand Total	1,391,109	1,494,438	2,114,414	*3,774,951	†6,493,557	‡6,418,565	5,241,965	4,473,532	5,962,178	6,454,171

* An amount of £7,080 was erroneously omitted from the total Imports for 1895, and has been included in those for 1896. † An amount of £87,299 was erroneously omitted from the total Imports for 1896, and has been included in those for 1897. ‡ *See* note †

Digitized by Google

Value of Exports from Western Australia to each Country, for each of the Ten Years, 1892-1901.

COUNTRY.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.
	£	£	£	£	£	£	£	£	£	£
UNITED KINGDOM—Total	395,700	349,080	330,216	328,125	508,755	1,736,205	2,293,652	3,774,247	4,268,419	5,625,459
COMMONWEALTH OF AUSTRALIA—										
Victoria	235,453	419,185	760,626	854,293	912,139	1,633,187	2,112,128	1,990,418	755,788	276,252
South Australia	66,022	40,448	34,038	50,873	37,836	313,152	281,388	265,583	223,285	146,685
New South Wales	12,497	19,324	34,707	26,075	12,579	31,717	65,465	676,401	143,388	149,558
Queensland	...	...	15	777	226	692	2,834	4,012	2,165	987
Tasmania	50	...	...	...	179	415	841	1,017	405	1,140
Total Exports to Commonwealth of Australia ...	314,022	478,957	829,386	932,018	962,959	1,979,163	2,462,656	2,937,431	1,125,031	574,622
NEW ZEALAND—Total	250	400	13	...	...	1,055	305	143	307	9,793
OTHER BRITISH POSSESSIONS—										
Canada	...	...	...	100	...	...	...	...	...	...
Cape Colony	...	640	13,566	377	...	27,339	40,533	9,600	84,167	166,777
Ceylon	...	100	...	...	160	...	4,097	8,233	445,074	1,626,185
Hong Kong...	23,845	17,704	16,128	7,871	17,837	8,854	14,517	23,385	20,833	50,478
India	150	2,259	...	300	...	120	31,559	9,847	513,661	43,390
Mauritius	4,836	9,392	4,033	150	6,207	1,540	1,037	3,264	3,251	3,430
Natal	...	...	70	8,579	38,632	34,690	20,785	46,520	124,027	69,459
Seychelle Islands...	...	...	436	...	...	...	...	...	...	...
Singapore	124,752	49,091	52,055	33,462	57,190	85,874	26,164	20,705	23,713	27,905
All other British Possessions	...	...	...	...	...	40	...	...	30	88
otal Exports to other British Possessions	153,583	79,186	86,288	50,839	120,026	158,457	138,692	191,554	1,214,756	1,987,702

Digitized by Google

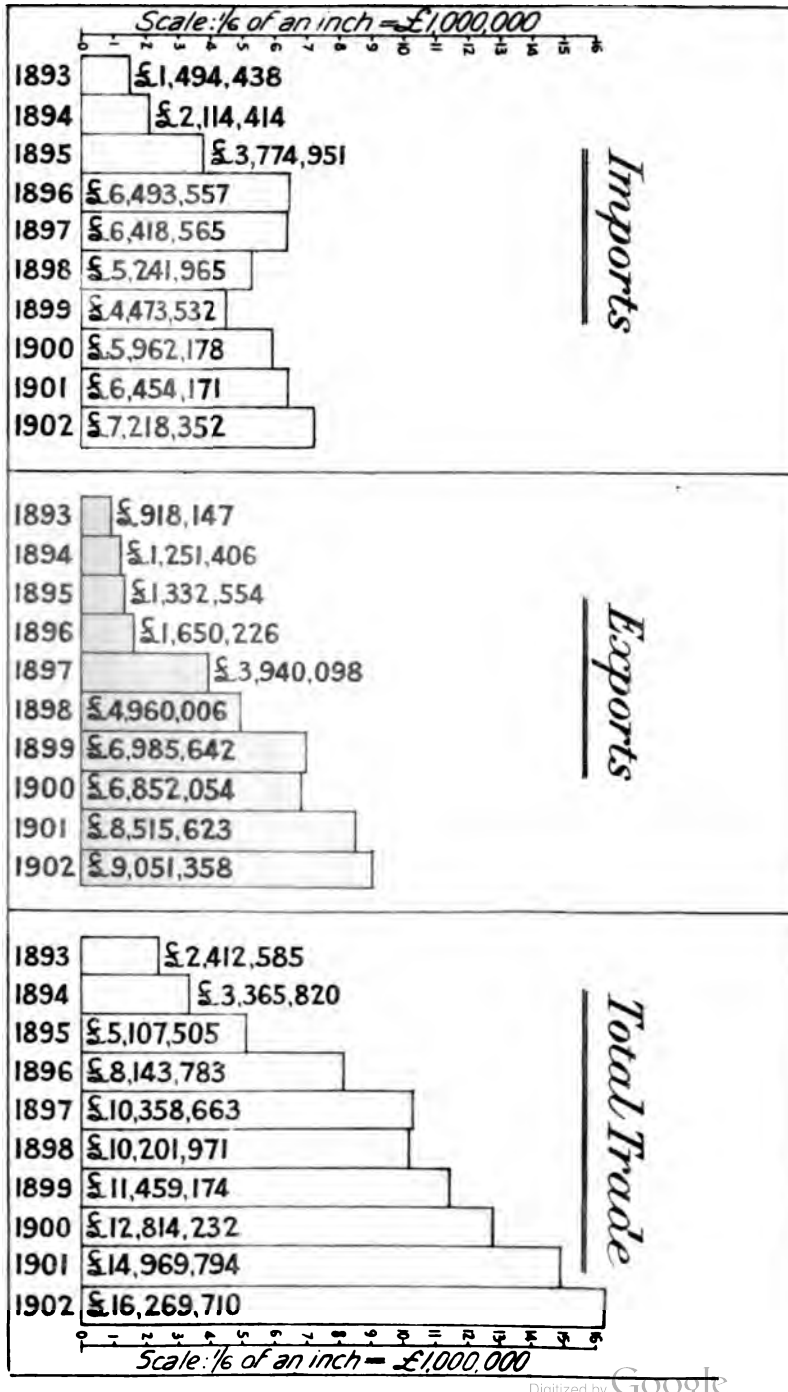
Value of Exports from Western Australia to each Country, for each of the Ten Years, 1892-1901—continued.

Country.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.
	£	£	£	£	£	£	£	£	£	£
Foreign Countries—										
Argentine Republic	...	...	...	50	...	...	2,935	5,456	53,258	39,818
Belgium	...	...	100	411	...	555	3,124	3,103	429	4,102
Brazil	...	...	...	...	...	53,886	...	...	...	...
China	2,670	...	123	6,084	14,791	...	...	...	14,227	11,841
France	340	175	2,264	8,985	11,403	7,633	4,501	7,847	42,058	110
Germany	4,439	7,352	2,679	50	3,957	2,580	3,036	4,574	1,802	9,686
Guam	3,620	75	50	...	28,240	120	50,946	58,213	103,812	186,339
Italy	...	...	...	...	...	...	61	...	...	3
Java	3,333	600	50	...	...	80	...	...	...	1,854
Lorenzo Marquez	...	...	100	5,742	...	...	...	...	...	...
Mahé	4,191	2,062	...	...	...	...	...	...	...	...
United States of America ...	...	...	28	150	5	120	...	78	175	273
All other Foreign Countries ...	...	260	109	100	...	244	98	2,996	27,780	64,021
Total Exports to Foreign Countries	18,593	10,524	5,503	21,572	58,486	65,218	64,701	82,267	243,541	318,047

Summary.

United Kingdom	395,700	349,080	330,216	328,125	508,755	1,736,205	2,293,652	3,774,247	4,268,419	5,625,459
Commonwealth of Australia ...	314,022	478,957	829,386	932,018	962,959	1,979,163	2,462,656	2,937,431	1,125,031	574,622
New Zealand	250	400	13	...	...	1,055	305	143	307	9,793
Other British Possessions ...	153,583	79,186	86,288	50,839	120,026	158,457	138,692	191,554	1,214,756	1,987,702
Total, British	863,555	907,623	1,245,903	1,310,982	1,591,740	3,874,880	4,895,305	6,903,375	6,608,513	8,197,576
Foreign Countries	18,593	10,524	5,503	21,572	58,486	65,218	64,701	82,267	243,541	318,047
Grand Total	882,148	918,147	1,251,406	1,332,554	1,650,226	3,940,098	4,960,006	6,985,642	6,852,054	8,515,623

Digitized by Google



Digitized by Google

Digitized by Google

The Imports, Exports, and Total Trade of Western Australia, from 1892 to 1901, with their value per head of mean population, were as follows:—

Year.	Imports.		Exports.		Total Trade.		Excess of Exports over Imports.	Percentage of Excess to Total Trade
	Total value.	Value per head.	Total value.	Value per head.	Total Value.	Value per head.		
	£	£ s. d.	£	£ s. d.	£	£ s. d	£	%
1892	1,391,109	24 18 2	882,148	15 15 11	2,273,257	40 14 1	*508,961	*22·39
1893	1,494,438	24 4 6	918,147	14 17 8	2,412,585	39 2 2	*576,291	*23·89
1894	2,114,414	28 3 5	1,251,406	16 13 6	3,365,820	44 16 11	*863,008	*25·64
1895	3,774,951	41 17 6	1,332,554	14 15 8	5,107,505	56 13 2	*2,442,397	*47·82
1896	6,493,557	52 18 6	1,650,226	13 9 0	8,143,783	66 7 6	*4,843,331	*59·47
1897	6,418,565	41 5 2	3,940,098	25 6 7	10,358,663	66 11 9	*2,478,467	*23·93
1898	5,241,965	31 0 4	4,960,006	29 7 0	10,201,971	60 7 4	*281,959	*2·76
1899	4,473,532	26 10 11	6,985,642	41 9 0	11,459,174	67 19 11	2,512,110	21·92
1900	5,962,178	33 13 5	6,852,054	38 13 11	12,814,232	72 7 4	889,876	6·94
1901	6,454,171	34 4 5	8,515,623	45 3 0	14,969,794	79 7 5	2,061,452	13·77

* Signifies excess of imports over exports.

The above table shows that between the years 1892-1901 the annual total trade increased from £2,273,257 to £14,969,794, or more than sixfold, being about twice the rate of increase in the population for the same period.

As regards imports, the high-water mark was attained in 1896, when, owing to the introduction of heavy shipments of mining machinery, hardware, and railway plant, in addition to extensive consignments of foodstuffs, wearing apparel, and general merchandise, consequent on the increased activity in mining development, and the resulting influx of population, which for that year was close on 36,000, the total value reached was no less a sum than £6,493,557, or £52 18s. 6d. per head of the mean population.

During the three succeeding years a continuous decrease was experienced, both in the total value of the imports, and also, to a larger extent, in the value per head, the lowest point being reached in 1899, with a total of £4,473,532, or £26 10s. 11d. per head. From this point onward there has been a gradual increase, the total for 1901 being £6,454,171, or within about £46,000 of the 1896 total, though the average per head, owing to the large increase in the population, was in 1901 £18 14s. 1d. less than in 1896.

In the case of exports a steady increase was experienced in the total value from 1892 to 1899, but in 1900, owing largely to the fall in the price of wool and a considerable decrease in the amoun

Digitized by Google

exported, together with a heavy reduction in the export of timber, the total receded by £130,000.

In 1901, however, wool "put up a record" in quantity, the export exceeding £13,500,000, though, owing to the diminished price obtainable, the value was actually £45,000 less than that recorded in 1899. In timber also, as regards both quantity and value, it was "a record year."

These increases, combined with the enormous output of gold, account in a large measure for the phenomenal advance in the value of exports for 1901, when the total exceeded that of the previous year by no less a sum than £1,663,569. Although, as a rule, the increases in the total value of exports have been continuous, yet, owing to the variations in the population, the averages per head have fluctuated somewhat, the lowest being £13 9s. in 1896, and the highest £45 3s. in 1901.

The balance of trade, it will be seen from the above table, was, in the past, against the Colony; a tendency to this preponderance of the imports, in fact, is noticeable throughout the greater part of the Colony's earlier history. During the ten years under review, however, this excess presented some interesting fluctuations, and, finally, since the year 1899, changed completely in favour of the exports. In the years 1892-3-4 the percentage of this excess to total trade remained practically stationary, but in 1895 it suddenly advanced to 47·82 per cent., and in 1896 reached 59·47 per cent. After that it fell with remarkable rapidity to 23·93 per cent. in 1897, and in 1898 reached 2·76 per cent. Then the change to the other side of the balance took place, and the percentage became 21·92 in favour of the exports in 1899. It fell back to 6·94 per cent. in 1900, but rose again to 13·77 per cent. in 1901. It must be noted that the years 1895 and 1896 witnessed the phenomenal development of the Eastern Goldfields. An analysis of the articles imported and exported during the years under consideration discloses an unmistakable connection between the development of the resources of the State and the fluctuations in the balance of trade. The large amount of money represented by the imports may be taken as indicating in its turn a form of permanent investment, lodged as it were in railway facilities, water supply and conservation, mining and reduction plants, and other works of general utility, both public and private, and destined to bear interest in the near future in the shape of the increased productiveness of the mineral and various other sources of wealth possessed by the State, which, without its means, would lie dormant. That this purpose has been achieved is proved by the remarkable increase lately attained in the value of the exports, especially in the case of gold and timber; a result which has at last reversed the balance of trade, the exports now exceeding the imports in value.

The following tables of some of the principal amounts which made up the imports and exports of the past ten years illustrate the facts just indicated. Those import figures, as a rule, are shown

Digitized by Google

which may be taken as being in the main responsible for the at one time abnormal growth of the total import figures. And it will easily be seen that the great demand for these articles was due to the peculiar conditions of a population not yet producing its own requirements, but in the aggregate expending large amounts in the opening up of new avenues of production. Several of the items bear directly on the development of the goldfields. Large sums were disbursed for the importation of horses and camels, and for fodder. But the amounts for Railway Stores exceeded almost every other item, increasing from £82,996 in 1892, to £647,588 in 1897. Apparel and Attire Articles, Piece Goods, etc., in 1900 amounted to £664,722, and in 1901 to £633,242. Mining Machinery reached, in 1896, the respectable figure of £364,706, and again, in 1900, a total of £322,296. The importations of Steel, increasing from £873 in 1892, to £316,600 in 1900, and £242,049 in 1901; Smelting Material from £80 in 1893, to £165,941 in 1900, and £55,814 in 1901; Cyanide, from £1,280 in 1896, to £129,964 in 1900, and £144,819 in 1901, all bear witness to the rapid development of the industries in which these articles are required. The most considerable factor of the imports of 1895 and 1896 was "coin," amounting in those years to £926,770 and £980,639 respectively, or nearly a million pounds each year. In view of the exceptional position "coin" occupies among the factors of trade, this item can hardly be considered as an ordinary import. Included in this list are the various provisions which the pastoral, agricultural, and other industries were unable to supply in proportion with the suddenly increased demand, and also large amounts for Government Stores, required, like the Government Railway Plant, in a proportion which naturally kept pace with the part the Government took in the development of Western Australia.

Among the more important exports of products of the State, gold, of course, occupies a unique position, and to it is almost solely due the rapid diminution and subsequent reversal of the excess of imports over exports. Nor is this to be wondered at, since the energies of a large proportion of the population have been to a very great extent occupied in its production. Of late, however, the timber industry also has assumed considerable importance.

It is notable that, since the opening of the Perth Branch of the Royal Mint, not only has the exportation of raw gold to the Eastern States and the importation of gold coin fallen to a comparatively insignificant amount, but the exportation of sovereigns struck in the State has risen from £50,000 in 1899, to £1,750,763 in 1900, and £2,807,841 in 1901. The exports of raw gold to the United Kingdom certainly did not show, at least during the first three years, the falling off that might have been anticipated. In fact, some evidently more potent cause made them increase from 710,258ozs., in 1899, to 736,580ozs. in 1900, and to 931,385ozs. in 1901. In 1902, however, the influence of the Mint began to operate in an unmistakable manner, for during that year the figures fell to 685,544ozs.

Digitized by Google

Articles of Import (1892–1901).

	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.
	£	£	£	£	£	£	£	£	£	£
Horses (for use) ...	55,608	32,560	50,442	40,218	83,775	29,336	5,304	10,698	16,780	31,254
Camels	6,840	350	51,172	46,374	28,970	34,875	2,180	...	...	80
Hay and Chaff ...	15,753	2,060	37,745	51,819	73,245	59,020	9,650	3,115	10,551	4,545
Oats	28,404	26,982	42,916	116,207	117,233	109,719	81,878	69,559	77,553	88,163
Railway Stores ...	82,996	244,988	144,293	180,734	468,074	647,588	382,904	139,867	130,996	331,919
Explosives (a) ...	2,334	2,778	13,486	25,685	50,841	77,460	72,847	80,182	138,997	129,411
Cyanide	...	...	...	...	1,280	7,531	36,773	55,849	129,964	144,819
Mining Machinery ...	7,953	11,200	35,842	139,925	364,706	201,169	247,691	170,562	322,296	172,681
Other Machinery ...	35,326	26,063	49,568	85,037	223,499	224,761	206,104	292,716	278,534	404,277
Smelting Material ...	...	80	131	21	81	100	6,860	42,691	165,941	55,814
Steel	873	1,122	3,694	4,353	16,587	16,068	12,839	201,565	316,600	242,049
Coal	13,840	15,202	21,782	29,479	39,503	94,938	84,246	95,144	110,699	158,471
Tools	8,143	6,072	25,550	31,726	69,015	50,663	28,610	19,022	28,258	39,812
Galvanised Corrugated Iron	20,934	23,893	32,967	57,987	105,010	179,407	137,115	43,753	27,769	21,547
Plain Galvanised Iron	3,185	3,800	4,728	9,170	45,242	4,403	10,495	24,605	121,345	89,992
Ironmongery and Hardware	28,776	20,613	25,792	37,858	100,963	77,724	47,398	25,309	36,632	46,245
Coin	11,420	139,300	239,900	926,770	980,639	65,850	135,300	5,245	4,118	26,060
Apparel and Attire Articles, Piece Goods, etc. ...	186,080	153,098	224,034	353,593	535,687	619,282	499,867	465,470	664,722	633,242
Cattle (for slaughter)	...	144	1,819	37,298	68,820	119,078	170,059	78,694	113,439	124,458
Sheep (for slaughter)	2,361	5	2,839	23,158	27,642	97,002	59,892	85,736	64,840	67,236
Pigs (for slaughter)	...	70	52	2,479	8,181	9,246	11,729	5,985	5,776	3,922
Poultry, etc. ...	165	245	542	1,786	3,196	3,218	2,059	1,610	1,136	1,472
Bacon, Hams, and Tongues	9,111	11,871	22,120	37,403	79,625	89,020	88,282	93,796	112,135	114,657

Digitized by Google

Meats	22,337	16,971	44,329	50,214	87,183	82,212	73,989	71,029	86,165	81,730
Fish	6,839	3,708	8,866	15,291	36,368	33,965	24,402	24,838	29,857	37,103
Eggs	1,874	2,122	4,996	11,920	33,389	51,429	52,667	50,682	60,465	57,430
Butter	29,059	36,148	50,354	73,999	148,971	188,478	195,467	184,239	204,457	247,808
Milk (preserved) ...	8,048	9,792	17,639	37,167	47,466	73,799	73,198	59,681	80,778	78,115
Sugar	56,491	51,940	55,178	54,239	92,685	105,366	111,085	112,745	128,889	132,539
Tea	32,247	27,426	41,912	36,440	59,957	56,174	65,417	65,237	70,334	88,160
Jams, Jellies, etc. ...	11,755	11,977	22,030	27,637	48,131	52,324	47,026	51,546	48,731	42,932
Wheat	17,376	2,189	3,307	17,812	40,120	51,282	56,906	11,714	11,446	29,679
Flour	48,323	46,120	44,300	62,712	152,135	197,519	156,411	75,159	66,028	85,378
Potatoes	7,238	7,147	10,121	10,219	33,601	43,795	69,430	28,130	24,570	57,029
Fruits	13,000	11,770	18,659	32,878	52,770	70,379	60,700	60,987	70,666	75,354
Wine	14,806	12,716	19,320	36,604	71,693	54,677	30,082	21,369	33,628	34,007
Spirits	45,875	38,398	50,650	80,494	123,510	136,824	104,344	90,525	126,394	112,124
Tobacco, Cigars, and Cigarettes ...	29,325	24,072	34,309	53,545	93,809	101,617	89,470	86,270	96,423	101,263
Oils	13,972	12,198	15,957	26,066	48,181	61,132	51,872	70,774	93,865	122,435
Timber	22,373	12,884	17,248	45,586	141,659	158,732	52,177	43,040	53,274	70,564
Furniture	11,000	5,803	12,503	24,623	51,100	58,402	25,894	17,883	26,181	30,921
Stationery	7,731	7,195	12,418	23,235	40,670	45,302	33,754	23,700	29,792	34,068
Government Stores...	26,977	16,566	25,863	38,099	145,963	187,308	104,973	23,905	67,033	78,989
Totals	946,820	1,079,638	1,541,373	2,997,860	5,041,175	4,628,174	3,819,346	3,184,626	4,288,057	4,529,754
Total imports ...	1,391,109	1,494,438	2,114,414	3,774,951	6,493,557	6,418,565	5,241,965	4,473,532	5,962,178	5,454,171

(a) Dynamite, Blasting Powder, Gelignite, Blasting Gelatine, Dynamite Gelatine, and Rackarock.

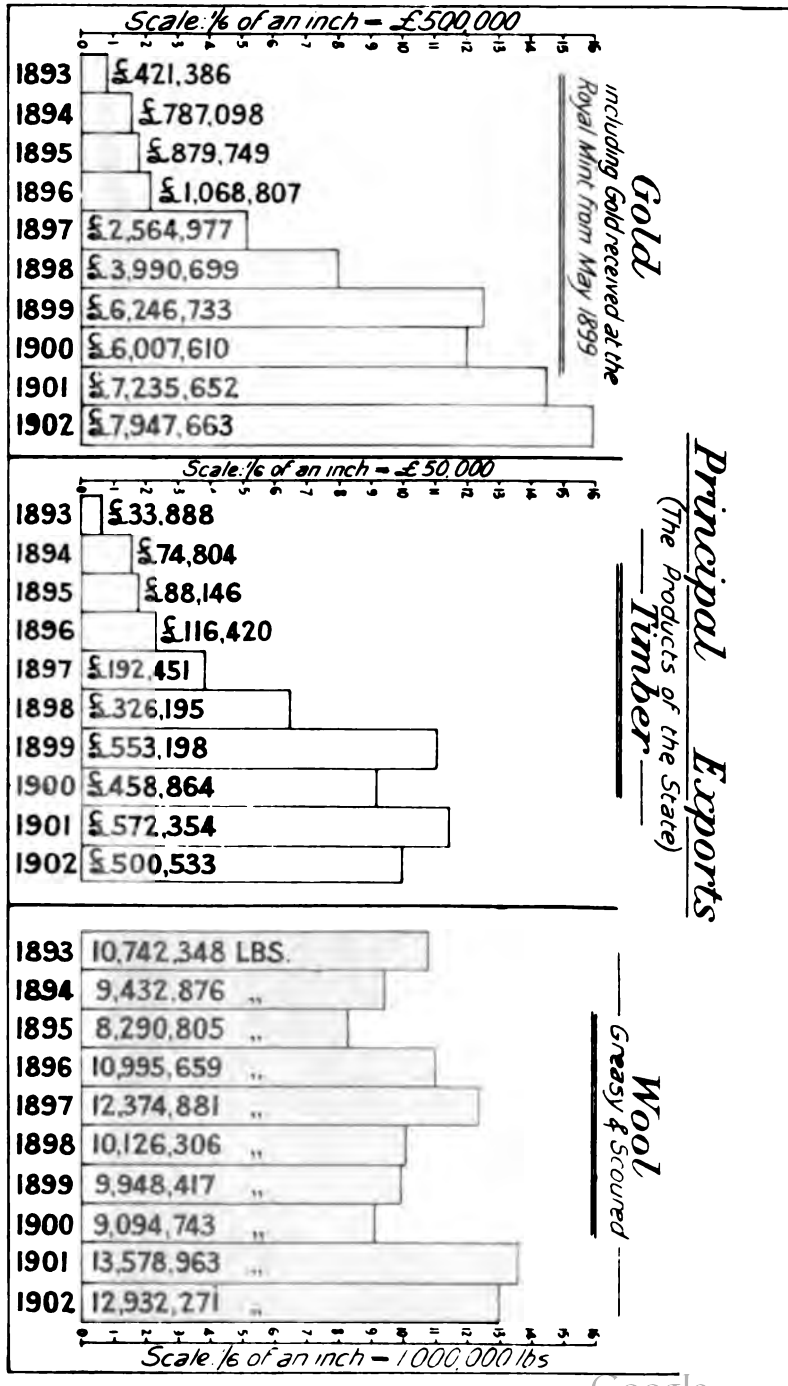
Digitized by Google

Exports (1892-1901) of Principal Articles, the Produce of the State.

	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.
Raw Gold (value) ... £	226,284	421,385	787,099	879,748	1,068,808	2,564,977	3,990,698	5,451,368	3,799,116	3,941,797
,, ,, ... ozs.	59,548	110,891	207,131	231,513	281,265	674,994	1,050,184	1,434,570	999,767	1,023,843
Gold Coin ... ... £	...	...	...	...	...	...	...	50,000	1,750,763	2,807,841
Wool (value) ... ... £	326,703	244,972	232,201	183,510	267,506	295,646	287,731	423,296	270,718	378,135
,, ... lbs.	8,712,080	10,742,348	9,432,876	8,290,805	10,995,659	12,374,881	10,126,306	9,948,417	9,094,743	13,578,963
,, per lb.	9d.	5d. & 9d.†	4¼d. & 8d.†	5½d. & 9d.†	5½d. & 9½d.†	5½d. & 9½d.†	6½d. & 1s.†	9½d. & 1s. 7½d.†	7d. & 10d.†	6½d. & 10d.†
Timber (value) ... £	78,419	33,888	74,804	88,146	116,420	192,451	326,195	553,198	458,461	572,354
,, ... loads	21,653	10,259	21,274	25,106	30,911	47,866	81,739	138,271	114,506	143,012
,, per load	£3 12s. 5d.	£3 6s.	£3 10s. 4d.	£3 10s. 3d.	£3 15s. 4d.	£4 0s. 5d.	£3 19s. 10d.	£4	£4 0s. 1d.	£4
Sandalwood ... ... £	42,870	32,160	23,430	30,863	65,800	49,480	31,812	29,719	39,038	73,931
Pearl-shell ... ... £	79,259	59,254	37,805	27,298	30,213	40,253	78,784	90,647	86,513	105,730
i.e., North-West, ... tons	781½	540½	423	352½	362½	366	538½	609¾	606½	717
,, per ton	£100 8s.	£107 6s.	£84	£74 10s.	£83 4s.	£105 11s.	£142 5s.	£143 5s.	£140	£146 9s.
,, (value) ... £	78,471	57,997	35,499	26,258	30,160	38,632	76,586	87,346	84,921	104,990
Shark Bay (value) £	788	1,357	2,306	1,040	53	1,621	2,198	3,301	1,592	740
Pearls (estimated) ... £	40,000	30,000	25,000	20,000	20,000	20,000	20,000	20,000	20,000	25,000
Skins ... ... £	36,657	23,975	14,775	18,588	18,111	28,031	44,545	61,998	54,099	64,222
Guano ... ... £	4,389	7,052	3,919	200	4,506	3,250	9,386	5,165	7,527	2,742
Hides ... ... £	240	294	103	353	458	9,965	15,681	20,983	20,803	22,337
Tallow ... ... £	...	87	90	12	20	2,104	2,787	4,525	4,244	9,741
Silver (value) ... ... £	...	...	...	...	...	...	...	...	3,594	7,609
,, ... ozs.	...	...	...	...	...	...	...	...	23,749	60,869
Tin Ore (value) ... £	13,843	11,134	15,274	9,703	4,338	3,275	2,760	23,163	38,178	39,495
,, ... tons	265½	228	390¼	277	137½	95½	68	308	470½	506½
Tin (Ingot), value ... £	...	...	...	...	...	...	...	...	18,872	12,607
,, ,, ... tons	...	...	...	...	...	...	...	...	142½	96½
Copper Ore ... ... £	8,696	606	...	12,952	100	1,033	4,266	41,452	16,462	54,903
Copper (value)‡ ... £	...	...	...	...	...	...	...	9	17,475	55,866
,, ‡ ... ... tons	...	...	...	...	...	...	...	(548ozs.)	249	880½
Precious Stones ... £	...	...	...	...	...	...	...	...	...	1,000
Horses (value) ... £	2,450	780	285	958	360	1,887	217	867	7,462	7,675
,, ... No.	245	74	5	22	36	82	20	35	434	504
Sheep (value) ... ... £	160	536	520	...	364	1,188	105	470	1,039	1,954
,, ... No.	300	1,551	1,300	...	1,004	1,794	300	1,133	1,628	3,028
Fresh Meat ... ... £	...	...	...	...	...	...	...	3,094	4,582	6,154
,, Fish ... ... £	...	...	...	...	...	...	...	731	1,317	877
,, Vegetables ... £	...	...	...	...	...	...	...	1,398	2,514	2,735
Totals ... ... £	859,970	866,123	1,215,305	1,272,331	1,597,004	3,213,540	4,814,967	6,782,083	6,622,777	8,194,705
Total Produce* ... £	870,814	870,437	1,219,047	1,273,638	1,603,748	3,218,569	4,820,420	6,793,946	6,639,827	8,216,718
Total Exports ... £	882,148	918,147	1,251,406	1,332,554	1,650,226	3,940,098	4,960,006	6,985,642	6,852,054	8,515,623

* Produce of the State exported. † Greasy and Scoured, respectively. ‡ Ingot and Matte.

Digitized by Google



Digitized by Google

Digitized by Google

A comparison of the imports and exports of the State during 1901 with those of the other States of the Commonwealth and of New Zealand for the same period reveals the fact that, though in the totals Western Australia is yet considerably behind the more populous of the sister States, yet, when the values per head of the mean population are taken, her imports, and more especially her exports, show a very much higher ratio than any of them.

States.		Imports.		Exports.	
		Total.	Per head.	Total.	Per head.
		£	£ s. d.	£	£ s. d.
Commonwealth.	Western Australia	6,454,171	34 4 5	8,515,623	45 3 0
	New South Wales	26,928,218	19 12 6	27,351,124	19 18 8
	Victoria	18,927,340	15 14 8	18,646,097	15 10 0
	Queensland ...	6,376,239	12 12 2	9,249,366	18 5 10
	South Australia ...	7,478,288	20 12 11	8,318,820	22 19 4
	Tasmania	1,965,199	11 6 5	2,945,757	16 19 4
New Zealand		11,817,915	15 3 10	12,881,424	16 11 2

Notes on some of the Principal Imports.

The imports of live stock during the last five years have been as follows:—

	1897. No.	1898. No.	1899. No.	1900. No.	1901. No.
Cattle (for slaughter) ...	12,306	16,028	7,921	12,309	11,984
Sheep (for slaughter) ...	113,998	81,531	88,338	89,844	70,099
Pigs (for all purposes) ...	7,898	8,889	4,322	5,706	2,145
Cattle (for breeding, etc.)	312	395	525	597	509
Sheep (for breeding, etc.)	1,422	1,215	2,924	5,230	3,532
Horses (for use) ...	1,908	312	516	768	1,167
Horses (for breeding, etc.)		103	66	163	325

It will be observed from the above figures that the imports of cattle for slaughter show a marked tendency to decrease, in spite of the constantly and rapidly increasing population of the State. The importation of sheep, also, fell very considerably during 1901; while the imports of pigs diminished to less than one-fourth of the figures for 1898. All this marks a distinct progress in the development of the live-stock industry. Yet the imports of cattle for breeding purposes do not show the increase which the demand for fresh, preserved, and salt meats, to say nothing about dairy products, still seems to warrant. The corresponding figures for horses and sheep, however, indicate an improvement.

Boots and shoes were imported in 1901 to the value of £101,761, as against £108,385 for the previous year; or a decrease in these articles of £6,624 during the twelve months. This falling off can only be accounted for—when we take into consideration that the mean population for 1901 exceeded that for 1900 by 11,530—by

Digitized by Google

Articles.	1900.	1901.
	£	£
Cocoa and Chocolate	11,883 ...	11,909
Coke and Patent Fuel	15,259 ...	27,544
Confectionery	8,143 ...	10,571
Copper Ware, etc....	5,841 ...	6,729
Cordage	22,806 ...	22,889
Cutlery	9,592 ...	9,768
Diving Apparatus...	7,710 ...	9,036
Drugs and Apothecaries' Wares	53,218 ...	51,280
Earthen and China Wares ...	15,126 ...	18,882
Electric Bells, Machinery, etc. ...	10,681 ...	18,806
Engine Packing	9,582 ...	8,030
Fancy Goods and Toys	16,591 ...	18,080
Farinaceous Foods	11,601 ...	10,210
Fire-arms, etc.	4,766 ...	6,926
Flock, Kapock, etc.	4,691 ...	7,150
Glass and Glassware	17,167 ...	22,278
Harness and Saddlery	13,395 ...	14,132
Hats and Bonnets...	5,958 ...	14,503
Hops	13,948 ...	14,418
Immigrants' Baggage	13,163 ...	15,690
Iron (bar and rod)	24,440 ...	39,209
Iron (gas, water, and drain pipes)	59,743 ...	48,727
Iron (pig)	9,590 ...	7,971
Iron (tanks)	8,328 ...	8,334
Iron (wire netting)	10,224 ...	8,655
Iron (materials for fencing) ...	19,894 ...	16,347
Jewellery	22,982 ...	28,390
Lampware	12,653 ...	14.505
Lead	16,210 ...	48,828
Leather	40,507 ...	44,062
Leather Goods	9,050 ...	10,832
Malt	26,739 ...	31,574
Manure	17,036 ...	18,632
Matches	9,071 ...	11,597
Metals	8,126 ...	8,143
Musical Instruments	16,275 ...	23,310
Nails, etc.	23,669 ..	25,645
Oatmeal	11,982 ...	12,424
Oilmen's Stores	15,431 ...	12,556
Onions	8,062 ...	15,381
Paints and Colours	7,840 ...	9,270
Paper of all kinds	45,827 ...	42,444
Photographic Material	6,802 ...	6,938
Pickles	7,035 ...	6,574
Plants, etc.	6,290 ...	6,728
Plate, Electro	10,784 ...	8,610
Pollard	8,655 ...	14,342
Powder, Baking, etc.	6,538 ...	5,992
Pumps, etc.	14,402 ...	12,867
Quicksilver	5,739 ...	6,335
Rice	14,174 ...	12,892
Saddlers' Ironmongery, etc. ...	5,103 ...	6,521
Sauces	12,508 ...	12,191
Sewing Machines, etc.	7,789 ...	9,205
Soap	17,891 ...	17,913
Stearine	27,546 ...	23,610
Telegraph and Telephone Material	1,443 ...	8,388
Vegetables	16,687 ...	16,229
Wire Rope	11,187 ...	8,567

Digitized by Google

Tables showing Totals of Imports from the States of the Commonwealth of Australia, distinguishing between "British and Foreign" and "Australian" Produce (1901).

	British and Foreign.	Australian.	Total.
	£	£	£
Victoria	262,348	1,013,133	1,275,481
South Australia	118,699	552,021	670,720
New South Wales	94,522	431,905	526,427
Queensland	353	23,950	24,303
Tasmania	10	62,079	62,089
Total	475,932	2,083,088	2,559,020

Notes on Exports.

The principal exports of the State are gold, timber, wool, pearls and pearl-shell, sandalwood, hides, skins of various kinds, silver, tin, and copper.

The value of the gold exported during the past five years shows an annual expansion as follows :—

	1897.	1898.	1899.	1900.	1901.
	£	£	£	£	£
Raw gold ...	2,564,977	3,990,698	5,451,368	3,799,116	3,941,876
Gold coin ...	...	...	50,000	1,750,763	2,807,841
Total ...	2,564,977	3,990,698	5,501,368	5,549,879	6,749,717

An increase of more than 163 per cent. in five years.

It is evident that the exact amount of sovereigns minted in Western Australia and exported from the State cannot be ascertained. It may, however, be presumed that the bulk of the gold coin export is local mintage.

As regards the timber export, the year 1901 proved a "record one," the quantity being more than 143,012 loads, valued at £572,354, as compared with 21,653 loads, valued at £78,419, in 1892; 47,866 loads, valued at £192,451, in 1897; and 114,508 loads, valued at £458,461, in 1900. Of the 1901 export, 101,636¼ loads were jarrah, valued at £406,545, and 41,375½ loads karri, valued as £165,502, the nature of the remainder, valued at £307, being unspecified in the Customs returns. The distribution of the export is world-wide, embracing, as it does, shipments to every continent. A very large proportion is sent to the United Kingdom, where it is chiefly used in street paving. Extensive shipments are also made for use in the construction of harbours, jetties, bridges, etc., as

Digitized by Google

also for railway sleepers and for other engineering purposes, for which strength and durability are required, to South Australia, Natal, Cape Colony, India, Argentina, New Zealand, the Philippine Islands, Singapore, Peru, China, and other countries.

That Western Australia is at present by far the most important timber exporter in Australasia may be seen from the following figures, giving the total export of timber, grown in the State from which exported, and the value per head of mean population during 1901, for each of the States of the Commonwealth and for New Zealand:—

	States.	Value of timber exported.	Value per head.		
		£	£	s.	d.
Commonwealth	Western Australia ...	646,285*	3	8	6
	New South Wales	143,549	0	2	1
	Victoria	10,305	0	0	2
	Queensland	19,513	0	0	9
	South Australia	3,473	0	0	2
	Tasmania	47,053	0	5	5
New Zealand		295,733	0	7	7

* Including £73,931, value of sandalwood exported.

The wool shipped from the various ports, for the last three years, has been as follows:—

Port.	1899. lbs.	1900. lbs.	1901. lbs.
Fremantle ...	1,385,728 ...	979,070 ...	2,454,891
Bunbury ...	125,882 ...	157,242 ...	194,784
Albany	716,841 ...	528,620 ...	1,253,624
Geraldton ...	2,437,035 ...	1,485,783 ...	3,569,638
Carnarvon ...	1,242,280 ...	1,688,243 ...	1,873,482
Broome	6,200 ...	— ...	6,630
Cossack	2,056,398 ...	2,058,228 ...	1,583,234
Derby	818,894 ...	898,145 ...	1,009,928
Onslow	1,041,506 ...	1,259,771 ...	732,271
Dongara ...	29,216 ...	* ...	*
Esperance ...	85,237 ..	... ...	135,669
Eucla	3,200 ...	... ...	...
Port Hedland ...	... ...	39,641 ...	764,812
Totals ...	9,948,417 ...	9,094,743 ...	13,578,963

* Probably shipped at Geraldton.

Consequent on the export of wool occasionally taking place during the early part of the year succeeding that in which it was produced, the figures above given cannot be taken as accurately representing the clip for the year specified. Should a fair concep-

Digitized by Google

tion of the yearly produce of the wool from the different districts be desired, the totals of the ports of those districts for the three years might be taken and divided by three. The decrease in weight of 853,674 lbs., from 1899 to 1900, was accounted for by Messrs. Dalgety and Co., as stated in the Collector of Customs' report for 1900, by the following facts:—The season for 1900 had been a very satisfactory one for pastoralists, so far as the growth of wool was concerned. Unusually good rains had fallen throughout the State, and though clips may not have been so heavy as usual, they were much cleaner, and should have commanded a higher price. Unfortunately, the exceedingly high prices that ruled at the end of 1899 so affected the buyers, that the demand diminished greatly, and the article steadily went down at each of the five successive sales held during the year, until, in October, 1900, it showed a decline of at least 40 per cent. on the prices of the last series in 1899. The end of 1900, however, showed a firmer market, with a slight improvement of from 5 to 10 per cent. It will be seen that the exports rose very considerably during 1901.

With regard to pearl-shell, the remarkable increase in the export since 1897 is a matter of considerable importance to this State. Some years ago the industry was a thriving and profitable one, and found employment for a large number of men. With a depreciation in the price of shell and denudation of many of the banks, however, numbers of vessels left this coast for pearling grounds on the Northern coast of Australia, where more profitable banks were discovered. With the detraction of large quantities of pearling plant and labour, and a steadily falling market, pearling operations, till 1897, went from bad to worse. In that year, however, a revival set in, with marked improvement in the London market, the result being that during the subsequent years the prices not only returned to their former profitable figure, but in 1901 the export rose to £105,730, and the business is now prosecuted with all the vigour and energy which characterised it in its halcyon days.

The first shipment of sandalwood was made in the year 1845; up to the end of 1901 our exports amounted in value to £1,748,951, the "banner year" being 1882, when sandalwood, valued at £96,050, was shipped out of the State.

The exports of skins for the past five years have been as follows:—

	1897. £	1898. £	1899. £	1900. £	1901. £
Sheep skins	25,509	39,278	43,816	38,563	40,362
Kangaroo skins	1,204	3,359	16,155	13,299	16,549
Opossum skins	558	1,908	1,967	2,237	7,311
Not otherwise enumerated ...	760	...	60	10	5
Totals	28,031	44,545	61,998	54,109	64,227

Digitized by Google

The exports of guano from the Abrolhos Islands during the year 1901 were valued at £2,742. This does not include considerable quantities locally utilised.

The shipments of copper and tin, of which there are large deposits in the State, have now become a very important factor in the exports of Western Australia, and silver also is a rising article.

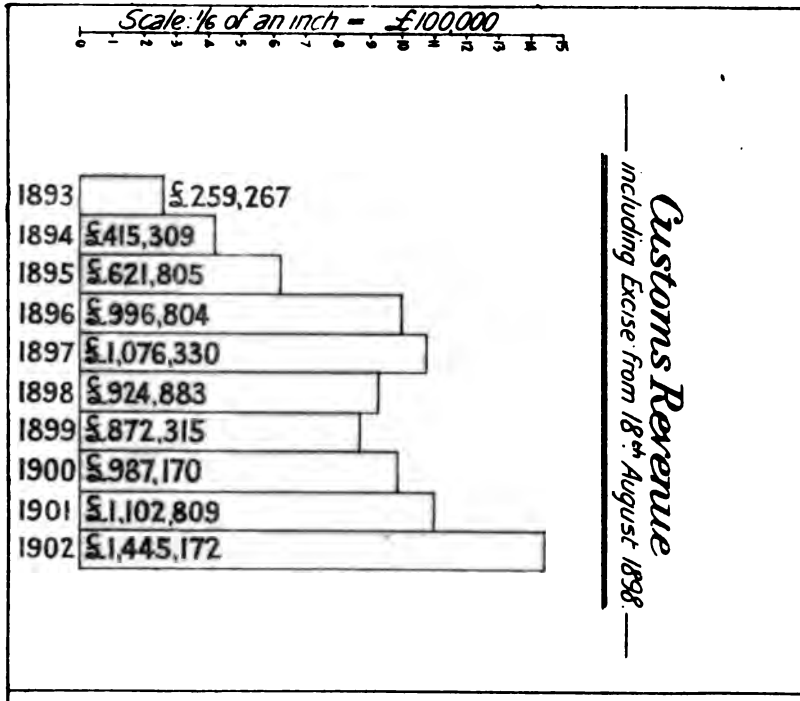
As there appears to be an erroneous impression that potatoes have only recently been exported from Western Australia, it may here be stated that not only was this article exported in 1897 to the value of £90, in 1899 to the value of £426, in 1900 to the value of £649, and in 1901 to the value of £699, but, between the years 1843 and 1871, it formed an almost continuously occurring item on the list of exports, its value rising in 1857 to £1,299. It may be mentioned, however, that the quantities appearing as exports in recent years consisted largely of ships' stores.

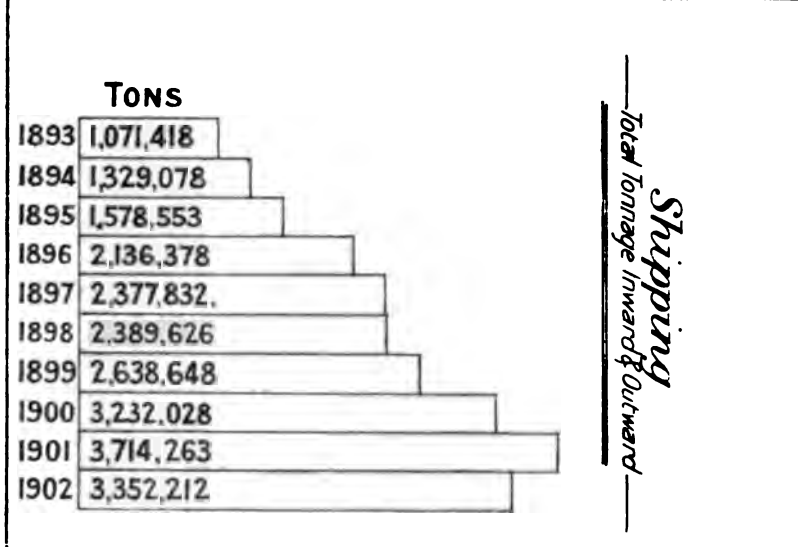
Customs Revenue.

Under Section 95 of the Commonwealth Constitution Act, it was enacted that "the Parliament of the State of Western Aus-"tralia may, during the first five years after the imposition of uniform "duties of customs, impose duties of Customs on goods passing into "the State and not originally imported from beyond the limits of "the Commonwealth, such duties to be collected by the Common-"wealth." Any duty so imposed on any goods was not, however, to exceed during the first of those years the duty chargeable on the goods under the law of Western Australia in force at the imposition of uniform duties, nor to exceed during the second, third, fourth, and fifth of those years respectively, four-fifths, three-fifths, two-fifths, and one-fifth of such latter duty, and all duties imposed under the above Section were to cease at the expiration of the fifth year after the imposition of uniform duties. If at any time, also, during the five years the duty on any goods under this Section was higher than the duty imposed by the Commonwealth on the importation of the like goods, then such higher duty was to be collected. Accordingly, at the present time, goods produced within the Commonwealth are dutiable under the State Tariff only, whilst Imports of British and Foreign origin are dutiable under the Federal Tariff, and the duties, with the following exception, are collected under its provisions, namely, when the State rate of duty on goods of British or Foreign origin is higher than the Federal rate, the higher duty is collected.

The following table, for the years 1896 to 1901, shows the Customs Revenue collected at each Port of the State, the Rebates, and the Excise Revenue. It will be seen that the Customs Revenue collected in Perth increased very rapidly during the Years under consideration:—

Digitized by Google





Digitized by Google

Digitized by Google

Ports, etc.	1896.	1897.	1898.	1899.	1900.	1901.
	£	£	£	£	£	£
Albany	54,430	44,254	36,623	28,816	28,232	26,404
Broome	3,074	4,372	4,911	5,625	7,607	8,273
Bunbury	8,567	15,738	13,925	13,950	11,428	9,517
Busselton	3,048	2,645	3,266	3,607	1,575	2,979
Carnarvon	2,219	2,416	3,693	2,554	3,059	3,121
Cossack	18,212	15,271	12,966	9,906	10,028	7,344
Derby	1,742	2,325	2,435	1,719	1,658	1,917
Dongara	1,993	1,682	1,785	1,313	1,217	1,066
Esperance	34,395	19,042	10,375	5,484	4,308	2,032
Fremantle	677,448	758,088	626,385	*559,942	628,965	706,879
Geraldton	65,270	52,542	49,921	45,457	46,468	50,213
Onslow	1,615	1,948	1,828	1,451	1,727	1,574
Perth	122,894	152,636	147,769	165,934	207,960	239,278
Port Hedland	...	...	...	...	110	4,350
Wyndham	1,897	3,371	1,274	1,700	3,255	1,196
			917,156	847,458	957,597	1,066,143
Rebates	...	...	2,484	1,900	2,092	3,030
Total Customs	...	...	914,672	845,558	955,505	1,063,113
Excise	...	...	10,211	26,757	31,665	39,676
Total Revenue	996,804	1,076,330	924,883	872,315	987,170	1,102,789

* Including £473 collected at Coolgardie during the Exhibition.

Digitized by Google

2.—SHIPPING.

A glance at the number of vessels engaged in the external commerce of the State during the past decade reveals a considerably more than twofold increase, whilst the nearly fourfold increase in their tonnage points to the fact that vessels of the present larger and improved type are now regularly engaged in the shipping trade of the State.

Year.	Entered.		Cleared.		Total.	
	Vessels.	Tons.	Vessels.	Tons.	Vessels.	Tons.
1892	356	572,090	320	552,475	676	1,124,565
1893	293	539,953	288	531,465	581	1,071,418
1894	372	675,775	349	653,303	721	1,329,078
1895	485	814,368	433	764,185	918	1,578,553
1896	768	1,105,907	683	1,030,471	1,451	2,136,378
1897	721	1,196,760	707	1,181,072	1,428	2,377,832
1898	633	1,199,894	631	1,189,732	1,264	2,389,626
1899	685	1,333,052	668	1,305,596	1,353	2,638,648
1900	769	1,625,696	747	1,606,332	1,516	3,232,028
1901	884	1,842,236	901	1,872,027	1,785	3,714,263

It is interesting to note what share of the shipping fell to each of the principal ports during each year of the same period.

Year.	Albany.	Broome.	Bunbury.	Busselton.	Cossack.	Derby.	Esperance.	Fremantle.	Geraldton.	*Other Ports.	Total.
					Number of Vessels entered.						
1892	215	32	1	...	...	5	...	74	1	28	356
1893	206	13	1	3	4	6	...	53	2	5	293
1894	271	2	...	10	...	16	5	63	4	1	372
1895	303	...	1	12	1	19	33	106	8	2	485
1896	398	4	4	11	2	14	111	212	12	...	768
1897	436	4	...	10	5	11	67	177	9	2	721
1898	387	7	4	14	1	18	16	184	2	...	633
1899	400	9	33	15	1	21	3	197	4	2	685
1900	454	12	33	16	...	10	3	234	4	3	769
1901	411	16	50	15	1	8	2	373	5	3	884
					Number of Vessels cleared.						
1892	203	12	3	3	1	12	...	55	5	26	320
1893	205	23	...	3	6	10	...	28	7	6	288
1894	240	2	...	11	4	15	5	65	7	...	349
1895	295	2	...	9	6	16	30	71	3	1	433
1896	357	6	8	18	...	13	107	144	30	...	683
1897	396	3	...	12	6	12	66	191	18	3	707
1898	360	2	2	19	6	16	14	207	5	...	631
1899	372	11	27	16	1	15	3	216	4	3	668
1900	420	7	44	8	1	9	2	247	6	3	747
1901	363	18	50	19	1	7	4	426	9	4	901

* Carnarvon, Eucla, Onslow, and Wyndham.

Digitized by Google

Year.	Albany.	Broome.	Bunbury.	Busselton.	Cossack.	Derby.	Esperance.	Fremantle.	Geraldton.	* Other Ports.
					Tonnage of Vessels entered.					
1892	482,680	14,643	782	...	...	4,639	...	56,408	1,587	11,351
1893	471,572	9,220	2,378	2,691	882	6,152	...	43,077	2,937	1,044
1894	585,195	74	...	5,022	...	17,452	2,520	62,600	2,873	39
1895	648,439	...	498	9,641	589	19,846	7,452	115,289	10,542	2,072
1896	800,757	3,824	4,928	7,737	62	15,419	30,004	232,299	10,877	...
1897	936,951	4,687	...	5,605	4,072	9,527	16,038	212,099	7,760	21
1898	865,581	7,486	2,541	9,455	89	21,586	5,830	286,230	1,096	...
1899	921,680	7,900	26,593	9,926	1,270	20,216	751	342,715	1,620	381
1900	1,032,435	11,982	29,594	15,595	...	10,131	196	522,152	3,014	597
1901	866,374	14,401	39,720	15,181	1,140	7,970	457	894,183	2,444	366
					Tonnage of Vessels cleared.					
1892	482,463	7,803	2,502	1,064	478	10,386	...	37,696	3,546	6,537
1893	478,006	5,776	...	1,353	5,503	7,848	...	26,829	4,415	1,735
1894	553,212	801	...	5,776	4,402	15,148	2,117	66,689	5,158	...
1895	640,129	171	...	7,563	7,724	16,224	9,688	76,765	4,885	1,036
1896	748,206	6,188	7,796	10,054	...	14,880	28,926	177,074	37,347	...
1897	885,304	3,094	...	8,174	7,138	11,365	19,301	225,073	19,902	1,721
1898	832,552	2,409	1,315	13,438	3,974	18,554	4,687	308,729	4,074	...
1899	871,219	9,622	23,809	11,101	641	15,800	816	368,890	3,260	438
1900	994,435	7,330	40,874	9,776	554	9,870	118	536,657	6,266	452
1901	801,333	15,718	48,222	18,271	1,140	7,228	498	970,012	8,446	1,159

* Carnarvon, Eucla, Onslow, and Wyndham.

Digitized by Google

From these tables it is evident that the increase in the totals is mainly traceable to the South-Western Ports; Albany, notwithstanding the loss of the English and French mail steamers, having nearly doubled her already considerable shipping, and Fremantle having progressed phenomenally, thanks to the completion of her harbour works. At Fremantle it must be noted that the tonnage increased in a far greater proportion even than the number of vessels, a natural consequence of the admission to her port of the mail steamers and other vessels of large size. At Albany, where the number of sailing vessels was proportionately much less than at Fremantle, the increased number of steamers visiting the port raised the tonnage more evenly. During 1901, the total shipping at each port, distinguishing between steamers and sailing vessels, was as follows:—

Ports.	Steamers.		Sailing Vessels.	
	Number.	Tonnage.	Number.	Tonnage.
Albany	708	1,598,854	66	68,853
Broome	27	29,775	7	344
Bunbury	30	39,493	70	48,449
Busselton	6	11,450	28	22,002
Carnarvon	...	...	2	999
Cossack	2	2,280	...	...
Derby	15	15,198	...	...
Esperance	2	547	4	408
Eucla	...	...	5	526
Fremantle	598	1,663,182	201	201,013
Geraldton	8	6,463	6	4,427
Total ...	1,396	3,367,242	389	347,021

The above figures do not, however, give a correct idea of the relative importance of the various ports in so far as the shipping business is concerned, owing to the fact that all purely local trade is excluded, whilst in the case of external traders the particulars are tabulated for the ports of arrival and departure only, thus swelling the returns of ports of entry and exit to the detriment of intermediate ports of call. Thus, in the case of a vessel from the Eastern States entering at Albany, calling at each port on the coast thence to Geraldton, and clearing eventually from Albany on the return journey, the figures tabulated would be one entry and one clearance at the port of Albany only, no credit being given to any of the intermediate ports, even, say, that of Fremantle, to which probably the greater bulk of the cargo would be actually consigned.

The following table gives a concise Summary of the business done at each Port of the State during the year 1901, as recorded in the Customs Returns, the Ports being arranged in the order of importance according to the amount of Revenue collected:—

Digitized by Google

Port.	Customs Revenue.	Trade.			Shipping Entered and Cleared.					
					Steam.		Sailing.		Total.	
		Imports.	Exports.	Total.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
Fremantle	706,879	4,774,774	7,395,032	12,169,806	598	1,663,182	201	201,013	799	1,864,195
Perth	239,278	1,215,235	9,992	1,225,227	...	...	...	...	...	...
Geraldton	50,213	137,086	126,972	264,058	8	6,463	6	4,427	14	10,890
Albany	26,404	182,609	394,181	576,790	708	1,598,854	66	68,853	774	1,667,707
Bunbury	9,517	42,280	140,158	182,438	30	39,493	70	48,449	100	87,942
Broome	8,273	33,083	117,808	150,891	27	29,775	7	344	34	30,119
Cossack	7,344	14,864	77,671	92,535	2	2,280	...	...	2	2,280
Port Hedland	4,350	7,026	56,784	63,810	...	...	...	...	...	...
Carnarvon	3,121	6,453	60,694	67,147	...	...	...	...	...	...
Busselton	2,979	14,379	68,906	83,285	...	...	...	...	...	...
Esperance	2,032	6,918	12,960	19,878	2	547	4	408	6	955
Derby	1,917	2,692	28,506	31,198	15	15,198	...	...	15	15,198
Onslow	1,574	1,624	25,035	26,659	...	...	...	...	...	...
Wyndham	1,196	2,603	22	2,625	...	...	...	...	...	...
Dongara	1,066	2,437	...	2,437	...	...	...	...	...	...
Eucla	...	10,108	902	11,010	...	...	...	...	...	...
Total	1,066,143	6,454,171	8,515,623	14,969,794	1,390	3,355,792	354	323,494	1,744	3,679,286

Digitized by Google

The foregoing figures furnish an illustration of the point previously mentioned in connection with the records of shipping entered and cleared at the various ports of the State. Thus, although Albany shows a total of 708 steam and 66 sailing vessels entered and cleared, as against 598 and 201 respectively at Fremantle, the value of the total trade of the former port is less than 5 per cent. of that of the latter. Further, such ports as Port Hedland, Carnarvon, Busselton, Onslow, and others, although doing a considerable external trade, fail to appear in the shipping returns, owing to the fact that they were not, during the year, ports of entry or clearance.

A comparison of the nationalities represented in Western Australian shipping is afforded by the following tables:—

Year.	Number of Vessels Entered and Cleared.							
	British.	German.	French.	Swedish.	Norwegian.	American.	Other.	Total.
1892 ...	586	24	48	3	10	—	5	676
1893 ...	509	13	46	1	6	2	4	581
1894 ...	624	19	48	9	18	—	3	721
1895 ...	826	9	48	6	19	4	6	918
1896 ...	1,248	39	49	13	71	13	18	1,451
1897 ...	1,190	88	53	—	68	12	17	1,428
1898 ...	989	105	58	11	92	--	9	1,264
1899 ...	977	141	52	9	137	10	27	1,353
1900 ...	1,164	129	52	14	111	12	34	1,516
1901 ...	1,355	143	54	17	138	25	53	1,785

Year.	Tonnage of Vessels Entered and Cleared.							
	British.	German.	French.	Swedish.	Norwegian.	American.	Other.	Total.
1892	913,866	16,204	182,216	2,911	5,465	...	3,903	1,124,565
1893	926,780	10,160	126,980	594	3,746	1,476	1,682	1,071,418
1894	1,159,661	12,623	137,544	5,952	11,460	...	1,838	1,329,078
1895	1,406,185	6,564	140,409	4,682	12,287	2,308	6,118	1,578,553
1896	1,815,665	88,510	137,120	6,871	51,990	9,143	27,079	2,136,378
1897	1,897,852	257,126	148,458	...	48,311	8,648	17,437	2,377,832
1898	1,839,940	314,419	158,173	9,725	60,109	...	7,260	2,389,626
1899	1,970,263	368,351	148,124	7,997	102,470	12,436	29,007	2,638,648
1900	2,538,570	389,042	148,488	15,635	87,211	12,571	40,511	3,232,028
1901	2,943,284	421,914	146,712	12,386	105.446	21,478	63,043	3,714,263

A notable feature of these figures is the rapid increase of German and Norwegian shipping, the former dating more particularly from the advent of the German mail steamers, and the latter being due in large measure to the increased activity in the timber trade.

Digitized by Google

It is also interesting to compare, in the following figures for 1901, the proportion of steamers and sailing vessels entered and cleared for the various nationalities :—

Nationality.	Steamers.		Sailing Vessels.	
	Number.	Tonnage.	Number.	Tonnage.
Commonwealth	442	662,511	32	8,936
Other British	796	2,173,651	85	98,186
American	...	...	25	21,478
Danish	...	...	5	3,670
Dutch	...	...	2	3,130
French	54	146,712	...	...
German	102	382,670	41	39,244
Italian	...	...	31	38,493
Norwegian	2	1,698	136	103,748
Portuguese	...	...	2	2,976
Russian	...	...	13	14,774
Swedish	...	...	17	12,386
Total	1,396	3,367,242	389	347,021

It will be seen that the number of Norwegian sailing vessels exceeded that of the Commonwealth and other British sail combined, although the tonnage of the former was less than that of the latter two added together. It should be noted that a large majority, especially of the Norwegian sail, entered the ports in ballast, while but a small proportion left in that condition, as is illustrated by the following table, which also gives the figures relating to steamers in this connection :—

Nationality.	Steamers.				Sailing Vessels.			
	Entered.		Cleared.		Entered.		Cleared.	
	With Cargo.	In Ballast.	With Cargo.	In Ballast.	With Cargo.	In Ballast.	With Cargo.	In Ballast.
Commonwealth	219	2	173	48	11	3	13	5
Other British...	341	51	326	78	22	18	30	15
American ...	...	...	...	...	10	1	4	10
Danish ...	...	...	...	...	1	2	...	2
Dutch ...	...	...	..	...	1	...	...	1
French ...	26	1	27	...	...	...	...	...
German ...	51	...	51	...	11	9	19	2
Italian ...	...	...	...	...	3	12	14	2
Norwegian ...	1	...	1	...	13	58	64	1
Portuguese ...	...	...	...	...	1	...	1	...
Russian ...	...	...	...	...	3	4	6	...
Swedish ...	...	...	...	...	1	8	8	...
Total ...	638	54	578	126	77	115	159	38

Digitized by Google

To what extent Commonwealth and other British vessels took part in British and foreign trade, and *vice versa*, may be seen from the following figures relating to the number of vessels, Commonwealth, other British, or foreign, arriving from, and departing for, British, Commonwealth, or foreign ports:—

Countries from or to which.	Steamers belonging to						Sailing Vessels belonging to					
	Commonwealth.		Other British Countries.		Foreign Countries.		Commonwealth.		Other British Countries.		Foreign Countries.	
	With Cargo.	In Ballast.	With Cargo.	In Ballast.	With Cargo.	In Ballast.	With Cargo.	In Ballast.	With Cargo.	In Ballast.	With Cargo.	In Ballast.
ENTERED.												
United Kingdom	...	...	76	2	...	...	...	...	14	...	13	...
Commonwealth...	188	...	211	1	37	1	8	...	...	...	...	...
Other British Possessions	31	2	38	46	2	...	2	1	1	16	5	76
Foreign Countries	...	...	16	2	39	...	1	2	7	2	26	18
CLEARED.												
United Kingdom	...	...	82	...	...	...	...	...	17	...	49	...
Commonwealth...	148	48	97	75	42	...	9	2	5	12	1	17
Other British Possessions ...	24	...	139	2	1	...	2	...	7	...	56	...
Foreign Countries	1	...	8	1	36	...	2	3	1	3	10	1

From the above table it appears that most of the Western Australian shipping in Commonwealth vessels was confined to the Commonwealth, that very little extended to foreign countries, and not any to the United Kingdom.

An idea of the numbers of the crews employed on the aggregate of the steam and sailing vessels which entered and cleared our ports during 1901, either with cargoes or in ballast, may be obtained from the following figures:—

Vessels.		Entered.			Cleared.		
		No.	Tonnage.	Crews.	No.	Tonnage.	Crews.
Steam	with cargoes	638	1,558,394	54,428	578	1,453,251	52,542
	in ballast ...	54	114,160	1,787	126	241,437	3,977
	Total ...	692	1,672,554	56,215	704	1,694,688	56,519
Sailing	with cargoes	77	73,989	1,204	159	141,661	2,185
	in ballast ...	115	95,693	1,547	38	35,678	565
	Total ...	192	169,682	2,751	197	177,339	2,750
Grand Total ...		884	1,842,236	58,966	901	1,872,027	59,269

Digitized by Google

An approximate comparison of the shipping figures of Western Australia with those of the other States of the Commonwealth and of New Zealand for 1901 is to be obtained from the following table :—

State.	Entered.		Cleared.		Entered.		Cleared.	
	Vessels.	Tonnage.	Vessels.	Tonnage.	Steam Tonnage.	Sailing Tonnage.	Steam Tonnage.	Sailing Tonnage.
	No.		No.					
West'rn Austr'lia	884	1,842,236	901	1,872,027	1,672,554	169,682	1,694,688	177,339
New South Wales	3,452	4,196,408	3,375	4,324,836	3,523,401	673,007	3,563,990	760,836
Victoria	2,418	3,392,226	2,347	3,323,265	3,110,217	282,009	3,052,564	270,701
Queensland ...	684	853,515	675	832,305	853,515	*	832,305	*
South Australia..	1,128	2,049,240	1,139	2,080,126	†1,825,900	223,340	‡1,855,176	224,950
Tasmania ...	816	706,044	820	726,681	679,551	26,493	700,025	26,656
Commonwealth	9,382	13,039,669	9,257	13,159,230	11,593,868	1,445,801	11,698,748	1,460,482
New Zealand ...	688	1,063,274	691	1,075,906	920,883	142,391	939,739	136,167
Australasia ...	10,070	14,102,943	9,948	14,235,136	12,514,751	1,588,192	12,638,487	1,596,649

* Included under Steam. † Including 82,542 tons Steam and Sailing entered at Port Darwin. ‡ Including 82,626 tons Steam and Sailing cleared at Port Darwin.

If they are to be used for comparative purposes, however, an explanation is necessary in connection with these figures, namely, that whilst they exclude the local coastal trade, all vessels engaged in the Interstate traffic are included, whilst the European mail steamers belonging to the P. and O., Orient, Messageries, N.D.L., and other lines which make Fremantle and Albany ports of call, both on their inward and outward voyages to and from the Eastern States, are in this State counted twice over as entered and cleared.

It has to be taken into account, therefore, in comparing our own figures with those of the other States of the Commonwealth that, whilst New South Wales may be regarded as the terminus of the voyage both in the case of the Interstate steamers and the European liners, and, therefore, only counts them once in and once out, the intermediate States of Victoria and South Australia count the same vessels twice coming and twice going. In the case of Western Australia, Fremantle being the port of arrival in and departure from the Commonwealth of the European mail steamers, the dual count takes place here also as far as these vessels are concerned; but since, as regards an Interstate vessel, a Western Australian port is necessarily the terminus of the journey, such vessel is, for each voyage, counted only once in at its port of arrival and once out at its port of departure. Taking, therefore, only the Interstate and mail vessels, to obtain a fair comparison of the shipping figures of the State referred to, New South Wales would have to double both her Interstate and European mail tonnage, whilst Western Australia would have to double her Interstate figures.

Digitized by Google

Western Australian Vessels.

The number and tonnage of steam and sailing vessels on the Register of the State on the 31st December, 1900; of those added to or struck off the Register during the year 1901; and of those remaining on the Register on the 31st December, 1901, may be seen from the following statement:—

Details.	Steam Vessels.		Sailing Vessels.		Total.	
	Vessels. No.	Net Tonnage.	Vessels. No.	Net Tonnage.	Vessels. No.	Net Tonnage.
Upon the Register 31st December, 1900	29	5,249	150	7,268	179	12,517
Details of vessels added—						
Vessels registered for the first time	2	1,730	13	164	15	1,894
Vessels registered *de novo*	...	...	1	161	1	161
Vessels purchased from foreigners ...	...	...	...	...	...	...
Tonnage added in consequence of re-measurement or alteration (without registration)	...	...	...	...	...	...
Total vessels added	2	1,730	14	325	16	2,055
Details of vessels struck off—						
Vessels wrecked, foundered, abandoned at sea, destroyed by fire, or otherwise missing	1	1,271	1	22	2	1,293
Vessels sold to foreigners	...	...	2	1,166	2	1,166
Vessels transferred to other ports ...	...	...	...	...	...	...
Vessels registered *de novo*	...	...	...	...	...	...
Tonnage deducted for alteration (without re-registration)	...	...	...	...	...	...
Total vessels deducted ...	1	1,271	3	1,188	4	2,459
Total remaining on the Register on the 31st December, 1901	30	5,708	161	6,405	191	12,113

From the above table it will be seen that during the year 1901 a total of 16 vessels, of an aggregate tonnage of 2,055 tons, were added to the register, most of these having been newly built in the State; whilst four vessels, of an aggregate tonnage of 2,459 tons, were struck off the register, two having been lost and two sold. The increase in the numbers of steam and sailing vessels during

Digitized by Google

the past ten years may be seen from the following table, relating to vessels remaining on the Register on the 31st December of each year:—

Year.	Steam.		Sailing.		Total.	
	Number.	Tons.	Number.	Tons.	Number.	Tons.
1892	8	1,285	142	5,293	150	6,578
1893	9	737	148	5,162	157	5,899
1894	9	737	143	4,639	152	5,376
1895	11	3,504	144	4,770	155	8,274
1896	12	3,563	132	4,550	144	8,113
1897	18	3,898	133	5,812	151	9,710
1898	28	5,551	133	5,799	161	11,350
1899	30	5,442	135	6,653	165	12,095
1900	29	5,249	150	7,268	179	12,517
1901	30	5,708	161	6,405	191	12,113

Of the vessels on the Register on the 31st December, 1901, 180 were wooden, with an aggregate tonnage of 6,756; seven were iron, tonnage 2,299; and four were steel, tonnage 3,058. The registration of vessels is effected at Fremantle.

3.—BONDING WAREHOUSES.

(On 31st December, 1901.)

Fremantle.

King's Warehouses.

Store "A," Customs Reserve, Cliff Street.
„ "B," Customs Reserve, Cliff Street.

Public Warehouse.

Dalgety & Co., Ltd., High Street.

Private Warehouses.

Dixson's, Newman Street.
Tolley's, Packenham Street.
Bateman's, Henry Street.
Samson's, Marine Terrace.
Shenton's, Cliff Street.
Sandover's, Mouatt Street.
Moylan's, Phillimore Street.
Monger's W.A. Stores, Ltd., Newman Street.
Wood, Son, & Co.'s, Cantonment Street.
Moore's, Henry Street.
Balchin's, Henry Street.

Digitized by Google

PERTH.

King's Warehouses.

King's Warehouse at Railway Station Yard.
King's Warehouse at Riverside.

Private Warehouse.

Milne & Co., William Street.

GERALDTON.

King's Warehouse.

Private Warehouse.

Burns, Philp, & Co., Durlacher Street.

King's Warehouses are also provided at each of the following out ports:—Albany, Broome, Bunbury, Carnarvon, Cossack, Derby, Dongara, Esperance, Onslow, Port Hedland, Vasse, and Wyndham.

4.—RAILWAYS AND TRAMWAYS.

GOVERNMENT RAILWAYS.

Information supplied by W. J. George, Commissioner of Railways.

HISTORY OF CONSTRUCTION.

Although the railway history of Western Australia commences at a date considerably later than that of any of the Eastern States of the Commonwealth, it is in many respects, as regards rapidity of construction and growth of traffic, unique in comparison with that of the Eastern systems. As distinguished from the previous condition of affairs, when the requirements and agricultural products of the older settlements formed the staple source of railway revenue, this more particularly applies to the last decade, at the beginning of which a large and prosperous traffic rapidly developed, engendered by the magnificent gold discoveries of the Coolgardie and Murchison fields.

It was not until the 26th July, 1879, that the first railway line of the Colony, that connecting the port of Geraldton with the copper mining district of Northampton, was opened; the permanent way being laid with rails as light as 35lbs. per yard, and the standard gauge, the one still adhered to, being 3 feet 6 inches. The construction

Digitized by Google

Digitized by Google

Digitized by Google

of this line was followed by the connection of Fremantle with Guildford (*via* Perth), opened on 1st March, 1881, to which line extensions were made to Chidlow's Well (*via* Smith's Mill) opened on 11th March, 1884, and to York and Beverley in 1885 and 1886 respectively, while branch lines from Spencer's Brook to Northam, and from Clackline to Newcastle followed in October, 1886, and January, 1888. In the meantime, the system having its terminus at the Northern port of Geraldton, was added to by a branch line to Walkaway, in the rich wheat district known as the Greenough Flats, which extension was opened on 21st July, 1887.

The advantages of railway communication in the Northern and middle portions of the agricultural districts of the Colony soon led to an agitation among the farmers of the South-West, with the result that on 12th March, 1891, a third separate system, for similar benefits, was added to the two previously mentioned by the opening of a line running 16 miles inland from Bunbury, through a rich agricultural district to Boyanup. The inconvenience of such a system, isolated as it was from the capital, however, quickly gave rise to further agitation, of which the practical effect was seen in the opening of 110 miles of connecting line in two sections during 1893, namely, from East Perth Junction to Pinjarra on 2nd May, and from Pinjarra to Picton Junction, near Bunbury, on 22nd August. To keep pace with increased settlement and production, extensions of the original Bunbury-Boyanup line were constructed and opened at intervals, viz., from Boyanup to Donnybrook, 16th November, 1893; a branch from Boyanup to the coast at Busselton, on 26th December, 1895; and an extension from Donnybrook through magnificent timber country to the old-established agricultural town of Bridgetown, on 1st November, 1898.

During the period just prior to and immediately following the institution of Responsible Government, on 21st October, 1890, prospecting for gold was energetically and successfully pursued, and resulted in rapid additions to the discoveries of the Murchison and Yilgarn districts. To assist the development of the resources so discovered naturally became the main object of the Government, and Bills were speedily passed for the construction of lines towards these two goldfields. From Northam to Southern Cross—a distance of 170 miles—the latter then being the principal gold producing centre of the Colony, the rails were quickly laid, the extension being opened on 1st July, 1894. Meanwhile, the Northern system had been connected with the Eastern and South-Western systems by means of the Midland Railway, built, after various vicissitudes, by a private corporation under a land grant concession; and on 21st November, 1894, a line leaving a point about nine miles from Geraldton, and known as the Mullewa Junction, was constructed towards the Murchison fields for a distance of about 57 miles, passing principally through pastoral country. The numerous further discoveries of auriferous country, however, prevented the possibility of these places remaining

Digitized by Google

as termini for any long period. Even while they were under construction, their extension was being discussed, and it soon became evident that the connection of the mining centres of Coolgardie and Cue, with their respective ports, must be effected as quickly as possible. Parliament at once, when applied to, passed the necessary enabling legislation without difficulty in regard to both projects. The extension to the Coolgardie goldfield, and thence Northwards, inclining to an ultimate junction with the Murchison system, was subsequently carried out as circumstances permitted, the sections being opened in the following order:—

Southern Cross to Boorabbin, opened 1st July, 1896.
Boorabbin to Kalgoorlie, opened 1st January, 1897.
Kalgoorlie to Menzies, opened 13th February, 1899.
Menzies to Leonora, opened 12th January, 1903.

A short suburban line from Kalgoorlie to Lakeside, passing along the world-famed Golden Mile, and serving the mines and their immediate population, was constructed, and was opened on 8th November, 1897. It was, in the first instance, laid more on the basis of a tramway than as a railway, but has since been brought up to the standard of a first-class suburban line for goods and passengers, the road having been duplicated, and interlocked signalling installed, and substantial buildings erected with every convenience for the large traffic which is carried. Subsequently, on 17th March, 1902, the Brown Hill loop-line, of 4½ miles, traversing the outer side of the "Golden Mile," and connecting with the Kalgoorlie-Lakeside line at Hannan Street and Kamballie Stations, was built and opened for the convenience of the mines and population on the North-Eastern side of the ridge of hills wherein the celebrated gold deposits are worked. A branch connnection of 12 miles from Kalgoorlie to Kanowna—then at a height of its alluvial fame—was opened on the 15th June, 1898.

In the Murchison district the extension of the line from Mullewa inland, 196 miles further to Cue, was completed and opened on 1st July, 1898, an additional extension of 46 miles to Nannine being opened on 1st June, 1903. The 1st July, 1898, also saw the opening of a branch line leaving the Perth-Bunbury Railway at Brunswick Junction, and running through the Darling Ranges for a distance of about 26 miles to Collie, at which place coal had been discovered and mines had been opened out, giving sufficient prospect of solidity to justify Parliament in authorising the construction of a railway for the assistance of their development. This important industry has since progressed to such an extent that the railways now draw nearly the whole of their supplies of coal from Collie, while, at the same time, a large private trade has also been developed.

While the additions to the railway system detailed in the preceding paragraphs were in progress, provision of local conveniences and improved traffic conditions had not been overlooked, nor had the

Digitized by Google

requirements of agricultural production been passed by. For the benefit of the race-going portion of the community, a very considerable one, a branch from the Perth-Guildford line to a point near the Swan River opposite the W.A. Turf Club's metropolitan course, at Belmont, had been opened on 1st January, 1885; it was now (in 1897) duplicated and extended over the river to a point close to the grand stand, being opened in its new form on 21st October of that year. Racecourse branches were also made available for the Canning and Bunbury courses on 22nd February, 1896, and 17th November 1897, respectively. On 1st July, 1896, a deviation or relocation of a portion of the Eastern main line through the Darling Range, between Bellevue and Lion Mill (*via* Parkerville) was opened under the name of the Mahogany Creek deviation, giving a ruling grade of 1 in 50 between the points named, as compared with the ruling grade of 1 in 25 over the old line, *via* Smith's Mill. The latter is still worked as a local line, under the name of the Smith's Mill branch, but the deviation *via* Parkerville has taken its place as a portion of the recognised main line. In addition to the previously mentioned lines of the South-West, agricultural cockspur branches were built in the Avon Valley district, leaving the main system at York and Northam, and running respectively to Greenhills and Goomalling. These were opened for traffic on 1st September, 1898, and 1st July, 1902. A connecting line of about three miles from the Fremantle Goods Yard to the Smelting Works, Explosives Depot, and Stock Jetty at Owen's Anchorage, intended exclusively for goods traffic was completed in October, 1898. On 1st July, 1903, the Upper Darling Range branch, running from Midland Junction into the Darling Range, 15 miles 2 chains in length, formerly owned and worked by the Canning Jarrah Timber Company, was purchased by the Government under the terms of the Company's original concession, and was opened for traffic as part of the State railway system.

So far as the agricultural prospects of the State are affected, however, perhaps the most far reaching event of the period under review lay, not in construction, but in the purchase of the lands and railway belonging to the West Australian Land Company. This property, which was acquired by the Government on 1st December, 1896, consisted of a railway 243 miles in length from Albany, the Southern port of the State, and the then port of call for mail steamers, to Beverley, the Southern terminus of the Eastern Railway. It had been built and opened on 1st July, 1889, by the company, the inducement being a grant of 12,000 acres per mile of line constructed, though half the frontage to the railway was reserved to the State. The policy of the absentee Board of the Company, however, in regard to the disposal and settlement of their vast estate had not been of a successful nature, and the purchase was dictated as much by the desire to unlock the land and to promote settlement as by any necessity for the acquisition of the means of communication afforded by the railway. The price was divided by the Government for book-keeping purposes

Digitized by Google

into £300,000 for the land, and £800,000 for the railway. The wisdom of acquiring the company's interest has since been made fully apparent in the settlement which has now taken place along a strip within 40 miles on both sides of the line, and in the present early prospect of an export trade in cereals and fruit from land which previously was to all intents and purposes unavailable for selection. The district is known as the Great Southern, the old title of the railway.

The mileage in operation throughout the State on the 30th June 1903, consisting of the above-named sections divided geographically into groups, covered a total length of 1,516 miles, exclusive of sidings. The details are as follow:—

Division.	Main Line.	Sidings.	Total.
	Miles.	Miles.	Miles.
1. Eastern Railway— Fremantle to Northam, including Owen's Anchorage, Belmont, Newcastle, Greenhills, and Beverley Branches, and Mahogany Creek Deviation	162	63	225
2. Eastern Goldfields Railway— From Northam Eastwards, including Kanowna Leonora, Lakeside, and Goomalling Branches, and Brown Hill Loop Line	526	71	597
3. South-Western Railway— From East Perth Junction Southwards, including Canning and Bunbury Racecourse Branches, Collie, Busselton, and Bridgetown Branches	234	35	269
4. Great Southern Railway— Beverley to Albany	243	13	256
5. Northern Railway— Geraldton to Nannine, and including Walkaway and Northampton Branches	351	22	373
Total	1,516	204	1,720

During the whole period from 1893 it was found necessary to be constantly adding facilities for the expanding traffic in the shape of additional stations and sidings, and of increasing the conveniences for the passage of goods and passengers at existing stations. Early in 1897 a policy was inaugurated of equipping all the more busy portions of the lines with the latest and most improved safe working appliances in the shape of interlocked signalling and electric instruments for controlling the movements of trains, and without doubt, the present immunity of the Western Australian Government Railways from any serious accident is due to the foresight which resulted in the adoption of this policy without waiting for it to be forced upon the department by means of some appalling catastrophe.

Digitized by Google

The following summary will serve to show in brief the results which have attended the operation of the Government Railways from their inception down to the 30th June, 1903 :—

Period.	Miles operated.	Net Earnings after payment of working expenses.		Capital Expended on Lines open.		Total.	Percentage on Loan Capital.		Percentage on Loan and Revenue.	
				Loan.	Revenue.		Profit.	Loss.	Profit.	Loss.
			£	£	£	£	%	%	%	%
6 months, 31st December, 1879 ..	35	Loss	727	132,000	20,741	152,741	..	0.55	..	0.47
12 months, 31st December, 1880 ..	35	Loss	1,225	132,000	20,741	152,741	..	0.93	..	0.80
Do. do. 1881 ..	55	Loss	481	259,936	20,741	280,677	..	0.18	..	0.17
Do. do. 1882 ..	55	Loss	448	260,438	23,240	283,678	..	0.17	..	0.16
Do. do. 1883 ..	55	Profit	562	260,586	25,217	285,803	0.22	..	0.20	..
Do. do. 1884 ..	72¼	Profit	2,695	356,668	25,217	381,885	0.76	..	0.71	..
Do. do. 1885 ..	124	Loss	635	551,521	25,217	576,738	..	0.12	..	0.11
Do. do. 1886 ..	133	Profit	2,212	684,045	25,217	709,262	0.32	..	0.31	..
Do. do. 1887 ..	161	Loss	2,903	784,408	26,599	811,007	..	0.37	..	0.36
Do. do. 1888 ..	188	Loss	5,658	789,545	39,556	829,101	..	0.72	..	0.68
Do. do. 1889 ..	188	Loss	7,537	789,573	43,507	833,080	..	0.95	..	0.90
Do. do. 1890 ..	188	Loss	6,527	789,576	43,507	833,083	..	0.83	..	0.78
Do. do. 1891 ..	203	Profit	498	855,763	59,051	914,814	0.05	..	0.05	..
Do. do. 1892 ..	203	Profit	3,547	881,348	62,048	943,396	0.40	..	0.37	..
6 months, 30th June, 1893 ..	203	Profit	7,598	897,544	62,048	959,592	0.84	..	0.79	..
12 months, 30th June, 1894 ..	321	Profit	36,591	1,107,173	62,048	1,169,221	3.30	..	3.12	..
Do. do. 1895 ..	550	Profit	113,955	2,030,324	62,048	2,092,372	5.61	..	5.44	..
Do. do. 1896 ..	580	Profit	265,911	2,167,468	149,356	2,316,824	12.26	..	11.48	..
Do. do. 1897 ..	830	Profit	337,828	3,526,431	208,016	3,734,477	9.58	..	9.04	..
Do. do. 1898 ..	974	Profit	233,359	4,824,981	222,280	5,047,261	4.84	..	4.62	..
Do. do. 1899 ..	1,270	Profit	292,291	6,073,058	354,312	6,427,370	4.81	..	4.55	..
Do. do. 1900 ..	1,355	Profit	398,042	6,472,722	383,641	6,856,363	6.15	..	5.81	..
Do. do. 1901 ..	1,355	Profit	308,784	6,690,131	408,108	7,098,239	4.62	..	4.35	..
Do. do. 1902 ..	1,356	Profit	265,059	6,997,431	412,995	7,410,426	3.79	..	3.58	..
Do. do. 1903 ..	1,434	Profit	305,612	7,739,538	402,244	8,141,782	3·95	..	3·75	..

* An amount of £29,975 has been credited to the expenditure under this heading on account of Rolling-stock written off.

Digitized by Google

[illegible] 1888 the railways have not only paid all charges [illegible] expenses and interest on the full capital [illegible] been able to pay in addition returned a handsome profit to the state. The policy has been, and is, to make revenue balance as nearly as possible with the outgoings on these two accounts, and it is to the changes in rates and charges brought into force at various dates with this object rather than to any other cause, that the fluctuation of the percentage returns is to be attributed.

Cost of Construction.

The average cost per mile of railway is the lowest throughout Australasia. This position is firstly the result of the general freedom of the country traversed from those engineering difficulties usually present in railway construction, and secondly of the system adopted of giving contractors the right of carrying traffic during the period of their contracts. With the exception of those comparatively small lengths of line running through, or into, the Darling Range, the railway system generally is constructed over country wherein the only impediment to be encountered has been the absence of water suitable for [illegible] purposes. As regards the result of the system of [illegible] adopted in at all events all goldfields railway contracts, the [illegible] average cost of construction at the completion of the respective [illegible] will serve to illustrate the point in question:—

[illegible]	[illegible]	[illegible] per mile (rolling-stock excluded).
[illegible]	[illegible] miles	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible]

Digitized by Google

ending 30th June, 1896, when the percentage of profit to Loan Capital, after payment of working expenses, represented no less than 12·26 per cent.

As regards the average cost per mile of railway open, inclusive of all plant, equipment, and rolling-stock, the undermentioned figures for the past eleven years may prove of interest :—

Date.	Miles open.	Total Capital cost.	Average cost per mile.
		£	£
30th June, 1893	203	959,592	4,727
„ 1894	321	1,169,221	3,642
„ 1895	550	2,092,372	3,804
„ 1896	580	2,316,824	3,995
„ 1897	830	3,734,477	4,499
„ 1898	974	5,047,261	5,182
„ 1899	1,270	6,427,370	5,061
„ 1900	1,355	6,856,363	5,060
„ 1901	1,355	7,098,239	5,239
„ 1902	1,359	7,410,426	5,453
„ 1903	1,516	8,141,782	5,371

The gradual increase in average capital cost per mile of railway, despite the opening sections having been constructed at less than the average cost, has been due to the many improvements carried out to meet the expansion of traffic, and also to the large quantity of additional rolling-stock purchased as required for the haulage or carriage thereof.

Rolling-stock.

The capital cost of rolling-stock was not separated from the general expenditure on lines and works until the year ending 30th June, 1896. From 1890 to 1895 inclusive, the lines then in operation were worked with the undermentioned engines and vehicles :—

Period ending	Average miles worked.	Locomotives.	Carriages.	Wagons.
30th December, 1890 ..	188	22	28	285
„ 1891 ..	203	28	34	474
„ 1892 ..	203	30	43	634
30th June, 1893 ..	203	33	48	715
„ 1894 ..	321	41	53	1,052
„ 1895 ..	550	49	75	1,459

During the year ending 30th June, 1896, the capital debit in respect of rolling-stock was extracted, and the proportionate costs thereof per mile open is therefore now readily available ; the figures,

Digitized by Google

together with those showing the growth of the working plant, being as under :—

Year ending 30th June.	Average miles worked.	Total Capital Debit in respect of Rolling-stock	Average Debit per mile of Railway.	Locos.	Carriages.	Wagons.
		£	£			
1896	580	145,538	251	74	102	3,360
1897	830	383,204	462	151	224	3,485
1898	974	801,538	823	186	289	4,478
1899	1,270	1,177,996	928	231	343	4,558
1900	1,355	1,322,915	971	233	*260	4,777
1901	1,355	1,400,746	1,034	† 229	260	4,819
1902	1,356	1,536,275	1,130	274	260	5,285
1903	1,434	1,924,934	1,342	316	264	5,694

* The apparent decrease was due to a re-classification of brake-vans formerly shown as passenger vehicles only, but divided at this date into their respective classes as used for goods and passenger services.

† Decrease represented by: Sold. 2: written off. 3: added. 1.

During the past decade the policy of the management of the Western Australian Railways has been to secure the heaviest possible train loads consistent with the weight of rail and width of gauge* available, and without undue restriction of speed. Financial considerations have, of course, necessitated at times a policy of hastening slowly towards the desired goal, but, nevertheless, a great deal has been accomplished. The standard axle was increased in size and strength in 1900, and, at the same time, the standard drawgear was improved in design with similar objects. This work is proceeding gradually, and is being debited in its entirety to working expenses, the locomotive branch bearing the debit.

While this policy has applied in the case of locomotives and goods wagons, the policy in regard to passenger vehicles has tended rather in the reverse direction, the consideration in this matter being to afford at once the maximum possible comfort to passengers, and particularly to those making the long journeys between the coast and the various goldfields districts, by providing lavatory accommodation, electric light and sleeping berths. Although the narrow gauge prevents the full attainment of the luxurious proportions of the wider lines, corridor carriages and dining cars have recently been placed on the road with a view of adding to the attractions—or rather perhaps of decreasing the disadvantages—of the journey between the coast and the Coolgardie and other Eastern Goldfields. The following

* The standard gauge for Western Australia is 3 feet 6 inches.

Digitized by Google

statements will afford full information in regard to the foregoing remarks :—

Locomotives.

Class.	Service.	No. in State 30/6/03.	Per Engine. Tractive power.	Per Engine. Total weight in working trim.		Date of introduction of Class on Traffic.	Remarks.
			lbs.	Tons.	cwt.		
A.	Shunting	5	6,642	30	7	6/3/83	
A.	Shunting	3	6,642	35	2	6/3/83	
B.	Shunting	11	10,425	32	0	1/6/84	
C.	Mixed and Mail ..	12	16,500	63	17	1/7/02	
D.	Shunting	1	3,645	12	8	1/3/84	
E.	Express, Mail, Mixed, and Goods	42	16,620	83	1	22/11/02	3 to arrive
Ec.	Express, Mail, Mixed, and Goods	20	16,000	73	0	7/8/01	
F.	Goods	15	21,445	81	8½	16/8/02	
G.	Mixed, Goods, and Shunting	45	10,915	42	2	10/1/89	
G	Mixed, Goods, and Shunting	21	10,915	43	13½	10/1/89	
H.	Shunting	2	3,780	14	1	6/7/89	
J	Mixed Goods and Shunting	3	9,620	49	0	6/1/92	
K	Goods	24	16,770	53	0	24/10/93	
M.	Shunting	2	6,920	30	0	1875	
N	Suburban Passenger, Express and Mail	32	12,610	44	4	10/9/96	
O.	Goods and Slow Mixed	46	16,810	58	9	19/9/96	
P.	Passenger, Mixed and Goods	2	8,435	51	1	8/7/96	
Q	Shunting and Goods	6	14,135	39	0	19/8/96	
R.	Express, Mail, and Mixed	24	11,855	55	16	25/2/97	
S.	Shunting	2	5,030	17	0	1/8/88	
T	Passenger, Mixed, and Goods	10	9,080	49	16	15/1/89	
	Total	328					

Digitized by Google

Carriages.

Class.	Description.	No. in State 30/6/03.	Per Vehicle. Tare		Per Vehicle. Seating capacity.	Remarks.
			Tons.	cwt.		
AA.	First, long distance, Bogie ..	19	18	15	25	
AB	Second, do. do. ..	10	18	0	42	
AC	Composite do. do. ..	16	18	0	36	
AC	Do. Bogie	4	16	7	56	
AC	Do. do.	19	14	10	44	
AC	Do. do.	27	14	10	50	
AC	Do. do.	4	14	14	56	
AD	Do. do.	40	15	0	36	
AE	First, do.	23	16	0	36	
AF	Second, do.	29	15	5	58	
AG	Second Saloon, Bogie ..	2	12	10	41	
AG	First Saloon, do. ..	3	12	10	40	
AG	Composite Saloon, do. ..	3	12	10	36	
AG	do. do. do. ..	10	14	0	46	
AH	First Saloon, six-wheel ..	1	10	0	30	
AH	Composite do.	6	10	0	44	
AI	Composite, four-wheel	8	4	5	18	
AK	Mail Bogie	4	14	10	..	
AK	Mail, six-wheel	3	9	6	..	
AL	Inspection Bogie	2	13	19	..	
AL	Do. do.	1	11	19	..	
AL	Do. six-wheel	1	9	10	..	
AM	Ministerial Bogie	1	19	4	..	
AN	Vice-Regal do.	1	18	15	..	
AO	Funeral, six-wheel	1	10	9	..	
AP	First Sleeping, Bogie	16	18	15	30	20 sleeping berths
—	Dining, do.	..	..		24	4 under order.
—	First Corridor sleeping, Bogie ..	..	..		33	9 do. do.
—	Second do. do. do. ..	..	28	15	48	9 do. do.
—	First Suburban, Bogie	..	..		48	6 do. do.
—	Second Suburban, do.	..	..		90	12 do. do.
ZA	Goods Brake Vans, with 2nd Class Passenger Accommodation	24	17	18	14	6 do. do.
	Total	278				

Brake Vans.

Class.	Description.	No. in State 30/6/03.	Per Vehicle. Tare.		Per Vehicle. Load.
			Tons.	cwt.	Tons. cwt.
AJ.	Express	10	19	0	
P.	Six-wheel	2	8	3½	
Z.	Bogie	78	11	0	
Z.	Bogie	1	14	12	
P.	Four-wheel	19	6	0	
	Total	110			

Digitized by Google

Wagons.

Class.	Description.	No. in State. 30/6/03.	Per Vehicle. Tare.		Per Vehicle. Load.	
			Tons.	cwt.		
A.	Horse Boxes, four-wheel ..	38	4	10	2 horses	
B.	Cattle Truck, four-wheel ..	31	4	0	6 cattle	
Ba.	Horse Boxes, Bogie ..	6	15	3	6 horses	
C.	Sheep Truck, four-wheel	23	3	15	60 sheep	
					Tons.	cwt.
D.	Covered Goods Van, four-wheel	129	3	19	6	0
Dw.	Workmen's Sleeping Vans, four-wheel	5	6	11½	6	0
Dx.	Weighbridge Testing Vans	2	5	7½	6	0
Dy.	Bullion Van	1	9	5	5	0
E.	Cold Storage Van, four-wheel	10	8	6	6	0
E.	Cold Storage Van, four-wheel	7	4	13	5	0
F.	Louvre Van, four-wheel ..	19	4	15	5	10
Fa.	Do. do. ..	52	6	8	7	10
G.	Highside, four-wheel ..	1,172	4	0	6	0
Ga.	Highside, four-wheel, standard	730	5	0	9	0
H.	Lowside, four-wheel ..	792	3	5	5	0
I.	Timber Truck, four-wheel	214	3	0	6	0
J.	Water Tank, six-wheel ..	3	4	14	1,500 gals.	
J.	Do. four-wheel ..	291	4	19	1,312 ,,	
					Tons.	cwt.
K.	Ballast Truck, four-wheel ..	71	3	14	5	0
N.	Timber Truck, four-wheel	76	3	5	6	0
O.	Powder Van, do.	10	4	14	5	0
Q.	Timber Truck, Bogie ..	64	7	10	12	0
R.	Highside, do. ..	925	7	10	12	0
Ra.	Do. do. ..	310	10	0	18	0
S.	Sheep Truck, do. ..	50	8	0	120 sheep	
					Tons.	cwt.
T.	Cattle Truck, do. ..	85	9	0	12	0
U.	Platform Truck, do. ..	86	6	16	12	0
V.	Covered Goods, do. ..	315	9	10	12	0
W.	Cold Storage, do. ..	12	17	12	12	0
Wo.	Meat Van, do. ..	2	10	17	12	0
X.	Coal Hopper, do. ..	1	10	6¾	16	0
Xa.	Do. do. ..	50	11	9	25	0
Y.	Powder Van, do. ..	4	10	10	12	0
—	Break-down Van, four-wheel	1	3	18	5	0
—	Break-down Van, Bogie ..	9	14	18¾	..	
—	Ballast Ploughs, six-wheels	2	8	0	..	
	Total	*5,604				

*This does not include 297 trucks used exclusively on jetties, and not fit for main line traffic.

Railways under Construction, etc.

On 30th November, 1903, the following sections of railway were under construction, authorised by Parliament, or to be purchased :—

(1.) *Malcolm to Laverton Railway.*—This will form an extension of the Eastern Goldfields Railway system, leaving the present line at Mount Malcolm. The total length of 54 miles is being constructed in two sections, a contract having been let on 29th June, 1903, for the 40 miles from Mount Malcolm to Mount Morgans, which, on 4th August, 1903, was extended to Laverton. The cost is being defrayed from Consolidated Revenue.

Digitized by Google

(2.) *Robb's Jetty (Owen's Anchorage, Fremantle) to Woodman's Point.*—Authorised by Act assented to on 20th December, 1902. The object of this extension is to enable the explosives magazines to be removed further from the centre of population at Fremantle, and to afford communication with the Quarantine Station at Woodman's Point.

(3.) *Collie—Collie-Boulder Railway.*—This is an extension of about 5½ miles, with power for a further extension of about 3¼ miles, in a Southerly direction from Collie. The line has been built under an arrangement with the Government by the lessees of a colliery said to contain coal of superior quality to that mined in the older collieries. The effect of the Act authorising the construction of this railway is to confirm the arrangement between the colliery lessee and the Government, and to enable the latter to take over the railway by purchase in accordance with the terms thereof This proposal, however, has not yet been carried out

The construction of railways must be specially authorised by Parliament, though Section 121 of "The Land Act, 1898," provides that a timber lease shall authorise the lessee without charge to construct railways and tramways on and through the area comprised in his lease, and to haul timber to and from the mills; and further, on conditions approved by the Governor as to the carriage of goods and passengers, to connect with the most convenient Government or private railway, and also to lay down such railways and tramways through Crown lands outside the area. By the Amending Act of 1902, however, the power is reserved to the Governor to revoke at will and without compensation any such permission as he may give for the above purposes.

The construction of new railways on behalf of the State is vested by the Public Works Act of 1902 in the Minister for Works, the duties of the Commissioner being confined to construction works on railways open for traffic. At the same time he is entitled by Act to decide on the position, character, and suitableness of stations and works to be constructed, though the Public Works Act allows the Minister for Works discretionary power whether such decision is to be acted upon.

In effect, therefore, the policy of constructing railways remains unencumbered in the hands of the Government of the day, the responsibility of the Commissioner beginning at the time when he is called upon to take them over and work them for public traffic.

ADMINISTRATION.

From the time of their inception until the inauguration of Responsible Government, the construction, maintenance, and control of all railways within the Colony were vested by Act in an official

Digitized by Google

holding the title of Commissioner of Railways, and having a seat in the Executive Council of the then Government. Very extensive powers for all purposes connected with railways were conferred upon this office, though in the earlier Acts private railway construction does not appear to have been contemplated. Subsequently, however, the Commissioner was called upon to exercise supervision over the safety of working and charges levied by private railway owners in a degree somewhat analogous to that for which in Great Britain the Board of Trade is responsible, whilst at the same time he was placed in a similar position as regards the Government railways, with the management of which he was himself charged. The position created, therefore, so far as the safe working of the Government railways was concerned, was that the Commissioner of Railways was his own judge—a position which, under the legislation in force, has continued to the present day.

The first definite proposal with regard to State railway construction in Western Australia is found in a report of a Select Committee of the Legislative Council on Public Works printed in 1871, when several lines starting from Fremantle were proposed. At the time nothing appears to have resulted from this inquiry, but in August 1872, another Select Committee of the Legislative Council inquired into the practicability of making a railway to the Eastern Districts. This Committee submitted to the Legislature estimates of the cost of constructing, maintaining, and working a line of 80 miles in length, together with an estimate (£9,700 per annum) of the probable traffic returns of such a line. Three alternative estimates were submitted of the cost of construction, the first, £1,089 per mile, being for a permanent way with jarrah rails, faced at curves with 3 inch by ½ inch iron, similarly to a line then in course of construction by the Rockingham Timber Company, which was inspected by the Committee on a locomotive which reached a speed of 15 miles an hour over such rails. The second estimates provided for 30lb. iron rails on longitudinal sleepers, which was to cost £1,266 per mile; and the third for 40lb. iron rails only, at £1,314 per mile. The rolling-stock and equipment —the latter including stations, buildings, water tanks, pumps, sidings, etc.—were estimated at £16,600 for the 80 miles.

The question of a railway to the Eastern Districts, however, was superseded about this time by the necessity for providing rail communication between Geraldton and Northampton, and the Loan Act of 1872, finally assented to on 15th August, 1872, after considerable correspondence between the Governor and the Colonial Office in London, authorised the raising of a sum of £1,675 for "preliminary railway surveys in the Champion Bay and mining districts.

These questions appear to have come under the general administration of the Surveyor General, the Hon. Malcolm Fraser, who at that period controlled all public works. In 1874, the Governor proposed to the Colonial Office the establishment of a separate depart-

Digitized by Google

ment of Public Works. Considerable correspondence on the subject followed until the appointment of the Hon. J. H. Thomas, C.E., as "the Government Engineer," who reported direct to the Governor under that title in July, 1876, as Director of Public Works in May, 1877, as Director of Public Works and Engineer of Railways in May, 1878, and as Commissioner of Railways in July, 1881. Under this title the principal executive and administrative authority of the Department has since been carried on. On the death of Mr. Thomas, in July, 1884, Mr. Clayton T. Mason, M.I.C.E., filled the position temporarily until the arrival of the Hon. J. Arthur Wright, C.E., from England in the following year. Mr. Wright carried on the several duties of Commissioner of Railways, Director of Public Works, and Engineer-in-Chief until the close of 1889, when he resigned his appointments to undertake the general management of the affairs of the West Australian Land Company at Albany. It was then decided to separate the railways from the Works Department, and Mr. Clayton T. Mason, M.I.C.E., who had meantime held the appointment of General Manager of Railways, became Commissioner of Railways again on 1st January 1890.

On the institution of Responsible Government, the office was converted into a Ministerial one, and the Hon. H. W. Venn, M.L.A., was appointed to the dual portfolio of Commissioner of Railways and Director of Public Works. He took over the duties of Mr. Clayton T. Mason, on 29th December, 1890, who, however, continued in the service of the department under the title of General Manager and Engineer for Existing Lines. That portion of those duties relating to the supervision of private railways—of which by this time, there was considerable mileage—fell practically into disuse; indeed, it had scarcely at any time been actively exercised, and the Commissioner of Railways thenceforward devoted his attention almost exclusively to the Government lines. It is for this reason that it has not been found practicable to include in this article detailed information relating to private railway construction.* In 1891, Mr. Mason was offered and accepted the position of Collector of Customs, and thereupon the Engineer-in-Chief (the late Mr. C. Y. O'Connor, C.M.G.), took over the general management, in addition to the performance of his other arduous and numerous duties. This step appears to have been prompted by the fact that the Commissioner carried out all works of construction through the medium of the Public Works Department—even to improvements and additions to lines open for traffic, and the purchase of rolling-stock therefor. The development of the business, however, progressed to such extent that the necessity for further skilled supervision almost immediately became apparent, and, the Government deciding to follow the example set by New South Wales in similar circumstances, the Agent General was instructed to obtain the services of an experienced officer from one of the leading British

* For particulars on this subject, collected by the Government Statistician, *see* next sub-chapter, relative to "Private Railway Lines."

Digitized by Google

companies. The selection fell on Mr. John Davies, then occupying a position on the staff of the London and North-Western Railway—the Railway which had given Mr. Eddy to New South Wales—and Mr. Davies accordingly took up the duties of General Traffic Manager of the Western Australian Government Railways on 9th January, 1892.

Towards the end of 1895 and during the earlier months of 1896 traffic over the railways increased in almost unprecedented proportions, owing to the rapidity of mining developments and to the rush of immigration attracted thereby. General goods (and machinery in particular) were being imported in quantities which the railway organisation had never previously experienced, and which were beyond the capacity of the facilities and rolling-stock at the command of the department, and considerably also beyond the capacities of the limited staff, recruited also of necessity in undue proportion from a class having little or no previous traffic experience. The result was that goods were landed at Fremantle and allowed to remain there, and what was known at the time as the "Block" took place, which led to popular dissatisfaction and public meetings of indignation. The upshot was that Mr. Venn then retired from office. During the period he had occupied the Ministerial seat the mileage of the railways had increased from 188 to 580 miles, the train mileage per annum from 280,000 to over 1,500,000, and the revenue from £45,000 to £500,000 per annum.

After a few weeks during which the Premier, Sir John Forrest, acted as Commissioner, Mr. F. H. Piesse, M.L.A., was appointed to the vacant portfolio, which he held from 1st April, 1896, until 8th September, 1900, when he resigned owing to a disagreement with his colleagues as to the policy to be adopted towards the labour organisations of railway employees. His tenure of office marked an epoch in West Australian railway history. As soon as he had had time to become acquainted with the detailed working of the department, Mr. Piesse acceded to Mr. O'Connor's request to be relieved of the responsibilities attaching to him in his capacity of Acting General Manager, the duties of the position of Engineer-in-Chief being at that time more than sufficient to engage his whole attention. On 1st January, 1897, the Commissioner appointed Mr. John Davies as General Manager, the position of Chief Traffic Manager being filled by the appointment of Mr. John T. Short, who had occupied a corresponding position in the West Australian Land Company's Great Southern Railway, then recently purchased by the Government. The internal system of organisation was greatly improved, particularly by the appointment of officers in charge of the various outlying districts, by the institution of a system of regular monthly conferences, at which the Commissioner met his principal officers for the discussion of the affairs of the department, and by his taking into his control the administration of capital expenditure and the

Digitized by Google

all works thereunder affecting lines open for traffic. The construction of new railways or extensions was left as formerly, and as it has continued to the present time, to be carried out by the Minister controlling the Department of Public Works. Mr. Piesse further made substantial reductions in fares and freight charges, notably by the removal of the 50 per cent. extra charge over goldfields lines, and also carried out or initiated many important works of improvement of which the most prominent were the Fremantle–Bellevue and Coolgardie–Kamballie duplications, with their attendant alterations and additions to the stations and works connected therewith, and the reduction of grades where practicable. At the same time very large orders for locomotives, carriages, and wagons were promptly placed and executed. During the financial year at the close of which he assumed office (1895–1896) 580 miles of railway were worked, 1,679,816 passengers and 435,855 tons of goods were carried, while for the last complete financial year of his administration (1899–1900) the figures were 1,355 miles, 6,225,068 passengers, and 1,384,040 tons of goods. At the same time, and notwithstanding the reductions in the basis of revenue, the net earnings of the railways, after payment of working expenses and interest charges, amounted to £162,099, as compared with £177,352 in 1895–1896.

Mr. Piesse was succeeded by Mr. B. C. Wood, M.L.A., whose appointment dated from the 8th September, 1900. Except in the matter of the recognition of the employees' unions or associations, to which his predecessor had been opposed, Mr. Wood carried on the policy and works initiated by the previous Minister until his resignation, with the rest of his colleagues, on 5th June, 1901, when the Leake Government succeeded that of Mr. Throssell.

Hitherto the positions of Commissioner of Railways and Director of Public Works had been combined, but Mr. Leake considered that the time was now ripe for their separation, and Mr. J. J. Holmes, M.L.A., whose criticisms of the railway administration under the Forrest and Throssell *regimes* had attracted considerable attention, was appointed the first Minister in charge of the separate department. The strong views he held led to a disagreement of opinion with his General Manager, and the rupture ended with the suspension of the latter gentleman from office, which extreme step was taken on 23rd August, 1901. After some delay, the charges leading up to this measure were investigated by an independent board of inquiry, of which Mr. Pendleton, Commissioner of Railways for South Australia, was President, and although Mr. Davies was exonerated of all but one or two minor errors of judgment, the effect left on his mind was such that he preferred not to resume his position, but resigned the service immediately after his re-instatement, being allowed leave until 30th June, 1902, and a retiring honorarium of £1,000, in recognition of his services to the State.

Digitized by Google

In November, 1901, the Leake Government was defeated, and Mr. A. E. Morgans, M.L.A., formed a Government, wherein Mr. Frank Wilson, M.L.A., filled the portfolio of Commissioner of Railways. He failed to be re-elected by his constituents, however, and shortly afterwards the Morgans Government resigned, and were succeeded by Mr. Leake, who returned to office with increased strength. Mr. Holmes, however, declined to again accept office, and the appointment of Minister of Railways was offered to and accepted by Mr. Walter Kingsmill, M.L.A., who had previously occupied the position of Minister for Works.

Mr. Kingsmill's principal work, during the period he held the appointment, lay in the revision of the Rate Book, as it was found that increases in wages and other items of expenditure had necessitated some increase in the basis of revenue. At the same time the view was gradually forced upon his mind that the detailed control of the department and its now enormous ramifications could not be efficiently performed by Ministers of the Crown, who come and go with the swing of the pendulum of public opinion, and who also have their own private business interests to watch in addition. Having come to this conclusion, and feeling that continuity in the administration of the department was an essential to its success, the Government (in which Mr. Walter James, K.C., had become Premier, on the death of Mr. Leake in June, 1902), on the recommendation of Mr. Kingsmill, decided to revert to the position contemplated when the office of Commissioner of Railways was instituted by the Railway Act of 1878, that is to say, to fill it by the appointment of a gentleman who should be an officer of the Civil Service, and whose qualification should rest rather on broad commercial experience than on close intimacy with the details of railway life and work, on which points it was considered that the advice of two co-commissioners or of the officers responsible for the respective branches of the department should suffice. Acting on the policy suggested by these considerations, the Government offered the position to Mr. W. J. George, at that time representing the Murray constituency in the Legislative Assembly. Mr. George accepted the offer, and commenced the duties of the position on 2nd July, 1902. On the same date a re-arrangement of the Cabinet took place, whereby the Minister for Works, Mr. C. H. Rason, took over the duties of Minister for Railways and Mr. Kingsmill became Colonial Secretary. The latter, on the first opportunity, introduced a Bill into Parliament providing for the appointment, for five years, of a board of three railway commissioners, to be free from political influence, and of whom Mr. George was to be chairman. The powers, duties, and conditions of tenure of office were defined on the basis of the agreement which had been made between Mr. George and the Government.

The proposal for three commissioners did not meet with the approbation of members, however, and it was therefore dropped, the Bill

Digitized by Google

being altered to provide for one commissioner only, in which form it received the Vice-regal assent on 20th December, 1902. The old-time Acts, of which the Act in question (2 Ed. VII., No. 35) was an amendment, continue to remain in force, with the exception that the powers which the latter did not specifically confer upon the Commissioner were transferred to the Minister for Works and Railways, and consequently certain anomalies and ambiguities are continued, with which it was intended shortly to deal by means of a consolidating Act, for which the necessity has long been evident, whereby the construction and working of the State-owned railways and the supervision of private railways will be more clearly and definitely separated and defined.

ORGANISATION.

The department is divided, for purposes of organisation, into four main divisions or branches on the lines usual with railways throughout the British Empire; that is to say, into the Administrative or General, Traffic, Locomotive, and Way and Works branches.

The Administrative Branch comprises the Commissioner's office, the Accountancy and Stores Branches. In the first named, all matters of policy or particular importance beyond the ordinary routine work are dealt with, and subjects affecting more than one branch of the service are also usually decided. The Accountancy Branch, under the Chief Accountant, deals with all financial matters, revenue, expenditure, and accounts. This branch formerly comprised the railway audit, but since 1st July, 1903, the latter duties have been placed under a distinct branch, controlled by the Chief Railway Auditor, the object being to obtain more frequent and thorough examination of accounts, and check against irregularity. The Stores Branch recently organised under the Chief Railway Storekeeper, buys, sells, and distributes all material and stores required by the various branches for the operation of the service. Until March, 1903, these functions were performed by the Government stores, an organisation which formed part of the Treasury Department, and which arrangement was found somewhat cumbersome in practice owing to its being separate and distinct from the Railway Department as regards control.

The Traffic Branch, that is to say, the branch which controls the operation of traffic, thus realising the object for which the railways were brought into existence, is presided over by the Chief Traffic Manager. There is not, as is frequently the case elsewhere, any distinct separate control of the passenger or coaching traffic and that of the goods traffic, so large a number of mixed trains and other arrangements wherein passengers and goods are combined in one service being necessary for economical working in a sparsely-populated country, that it has not been considered of advantage to bring about such separation. For purposes of working the branch is divided

Digitized by Google

into four districts, each in charge of a responsible officer, called District Superintendent. The districts are as follows :—

District Superintendent Stationed at—	District.
Perth ..	Fremantle to Albany, Northam, and Goomalling, including all Branch Lines, and East Perth to Brunswick Junction
Kalgoorlie ..	Northam to Leonora (exclusive of the Goomalling Branch), Lakeside, and Kanowna
Bunbury ..	Brunswick Junction to Collie, Bunbury, Busselton, and Bridgetown
Geraldton ..	Geraldton to Cue, Walkaway, and Northampton

All matters of local traffic import should, primarily, be referred to these officers, as it is upon reports obtained from them that the Chief Traffic Manager necessarily relies to a certain extent in the numerous matters placed before him by the public.

The Locomotive Branch, under the superintendence of the Chief Mechanical Engineer, does all that is necessary for the operation of the rolling-stock required by the Traffic Branch for the purpose of meeting the requirements of the customers and passengers of the department. Its work naturally divides itself into repairing and running. The workshops are at Fremantle, and being admittedly inadequate for the work required to be done in them, the branch has suffered severely in the matter of expenditure, its percentage being the highest in Australasia. The defect has, however, been recognised, and the construction of large and up-to-date workshops at Midland Junction has been in hand by the Government for some years. The expenses of the several water famines through which the department has passed during the last few years have also been mainly borne by this branch and have contributed considerably to the result referred to ; the difficulties of the summer of 1901-1902 having been estimated to have added to the expenses of this branch no less than £80,000 in fitting wagons for the haulage of water and in the running of 168,000 train miles exclusively for the conveyance of water for locomotive purposes. The Chief Mechanical Engineer is assisted by the Works Manager and the Chief Rolling-stock Inspector, whose duties are, as far as the circumstances of the branch admit, analogous to those of the District Officers of the other branches. The control of all telephone lines, electric lighting, etc., and other electrical work used for the business of the department are also under the supervision of the Chief Mechanical Engineer. The department's operations so far have not included the local construction of rolling-stock, which, with the exception of a few engines and wagons urgently required and obtained from America, has all been imported from

Digitized by Google

Great Britain, and put together on arrival at the Fremantle workshops.

The Way and Works Branch is under the control of the Chief Engineer for Existing Lines, who is responsible to the Commissioner for the proper and efficient maintenance of the railways, and all buildings, bridges, and other works connected therewith. All construction works are also carried out by this branch so far as lines open for traffic are concerned. The Chief Engineer is assisted by an Assistant Engineer and by three Resident Engineers, who are responsible for the districts under their control.

Resident Engineer Stationed at–	District.
Perth ..	Eastern, South-Western, and Great Southern Railways—viz.: Fremantle to Northam, Albany, Bunbury, Busselton, and Bridgetown, including all Branch Lines
Coolgardie ..	Eastern Goldfields Railway—viz.: Northam to Leonora, Kanowna, and Goomalling.
Geraldton ..	Northern Railway—viz.: Geraldton to Cue, Northampton, and Walkaway.

The interlocking and signalling arrangements are also under the control of the Way and Works Branch. Interlocking was first installed in Western Australia during the year ending 30th June, 1898.

In regard to the expenditure by the respective branches, the statement hereunder will serve to convey an idea of the proportions of the whole cost for which each branch is responsible, on the basis of organisation, of which an outline has been given above :—

Branch.	1897–1898.	1898–1899.	1899–1900.	1900–1901.	1901–1902.	1902–1903.
Locomotive ..	42·01	44·23	49·37	49·67	55·38	53·68
Way and Works	20·53	20·73	19·07	19·11	17·64	19·11
Traffic	35·09	32·40	29·86	28·99	24·97	25·42
General administration	2·37	2·64	1·70	2·23	2·01	1·79
	100·00	100·00	100·00	100·00	100·00	100·00

The most striking feature of this statement lies in the high proportion of expenditure by the Locomotive Branch, which may be said to be due to the congestion of the Fremantle workshops and the expense of water supply already referred to, combined with the excessively high prices paid for fuel during the last three years shown. The last-named item has recently been materially reduced, the second is considerably relieved now that the Coolgardie Water Scheme is in

Digitized by Google

working order; the first will probably show the reverse of improvement until such time as the new Midland Junction workshops are completed and utilised, and when economical conditions of working will be practicable.

The following statement of the details of expenditure for financial years 1901-1902 and 1902-1903 by this branch of the service may, in view of the high percentage proportion, be of interest:—

Particulars.	Expenditure.						Average cost per train mile in pence.
	Year.	Salaries.	Wages.	Stores.	Incidentals	Total.	
		£	£	£	£	£	
Salaries, travelling, and incidental expenses; stationery and printing in connection with loco. running and repairs	1902	19,013	2,216	223	1,733	23,185	1·23
	1903	18,392	2,936	157	1,794	23,279	1·21
Wages, expenses, and allowances of drivers, firemen, cleaners, fuelmen, storemen, and others, in connection with the running of locomotives, and repairs and renewals to tools and other running appliances	1902	..	161,240	2,976	1,144	165,360	8·80
	1903	..	170,681	1,397	1,453	173,531	9·03
Coal, coke, and wood	1902	..	..	131,376	..	131,376	6·99
	1903	..	..	113,717	..	113,717	5·91
Purchase of water; wages and stores for pumpers, and repairs to pumps	1902	..	8,782	37,288	..	46,070	2·45
	1903	..	7,646	25,163	..	32,809	1·70
Oil, tallow, and other stores for locomotive running purposes	1902	..	..	9,873	..	9,873	·52
	1903	..	..	11,070	..	11,070	·57
Wages and materials; repairs and renewals to locomotives	1902	..	75,844	45,589	312	121,745	6·48
	1903	..	81,546	31,382	746	113,674	5·92
Salaries, travelling, and incidental expenses; stationery and printing in connection with carriage and wagon repairs, and renewals	1902	4,327	1,910	267	383	6,887	·37
	1903	4,835	2,389	162	779	8,165	·42
Wages and material; repairs and renewals to carriages	1902	..	15,724	8,642	31	24,397	1·30
	1903	..	16,603	8,271	73	24,947	1·30
Wages and material; repairs and renewals to wagons	1902	..	40,037	38,300	85	78,422	4·17
	1903	..	37,766	32,231	290	70,287	3·66
Wages and material; greasing and oiling coaching and goods stock	1902	..	11,130	2,129	11	13,270	·71
	1903	..	13,697	3,093	53	16,843	·88
Totals	1902	23,340	316,883	276,663	3,699	620,585	33·04
	1903	23,227	333,264	226,643	5,188	588,322	30·62

Digitized by Google

In addition to the above the Locomotive Branch has borne the debits in respect of maintaining the capital value of locomotives, by replacing annually one-twenty-fifth of the value of locomotives in stock from working expenses. This policy is based on an assumed life of twenty-five years for a locomotive. During the two years mentioned considerable sums also have been spent in similar manner in rebuilding wagon stock which had become defective or obsolete in design. The expenditure on these accounts has been as follows :—

1901–1902 .. .. £49,000 | 1902–1903 .. .. £54,486

STAFF.

The total number of employees engaged in the service of the department, exclusive of construction hands, averages about 6,200 men.

DESCRIPTION OF LINES.

It has been previously stated that the railway system of the State is divided into five divisions or sections, and possibly some description of the leading features of these sections may be of general interest.

1. Eastern Railway, consisting of the following subdivisions :—

Subdivision.	Length of Main Line.						Highest Station.		Lowest Station.		Height of Line above Sea.		Steepest Gradnt.	Weight of Rails per yard	Date when opened for Traffic.
	Double.		Single.		Total.		Name.	Height	Name.	Height	Highst.	Lowest			
	Mls.	Chs.	Mls.	Chs.	Mls.	Chs.		Feet.		Feet.	Feet.	Feet.		Lbs.	
Fremantle-Guildford ..	19	63	..		19	63	Leederville ..	107	Fremantle ..	5	117	5	1 in 80	58	Mar. 11th, 1884
Guildford-Chidlow's Well ..	3	79	17	12	21	11	Mundaring ..	1,034	Guildford ..	25	1,055	25	1 „ 25	58	*a* Mar. 1st, 1881
Perth Racecourse Branch	1	69	..		1	69	Racecourse ..	19	.. .. ..	..	22	9	1 „ 80	58	*b* Jan. 1st, 1885
Chidlow's Well-York ..	..		48	72	48	72	Chidlow's Well	980	Spencer's Brook ..	520	1,068	520	1 „ 45	60	1885
York-Beverley	..		20	46	20	46	Edwards' Crag.	653	York ..	579	669	579	1 „ 60	60	*c* Aug. 5th, 1886
Spencer's Brook-Northam	..		5	73	5	73	Spencer's Brook	520	Northam ..	490	520	490	1 „ 80	60	*d* October, 1886
Clackline-Newcastle ..	..		14	34	14	34	Hoddy's Well	1,061	Lloyd's ..	463	1,147	443	1 „ 40	46½	*e* Jan. 3rd, 1888
Mahogany Creek Deviation	..		11	71	11	71	Lion Mill ..	883	Bellevue Junction ..	57	971	57	1 „ 50	60	*f* July 1st, 1896
York-Greenhills	..		14	33	14	33	Greenhills ..	706	York ..	579	828	579	1 „ 60	45, 46½	Sept. 1st, 1898
Fremantle-Owen's Anchorage	..		2	60	2	60	.. .. ..	..	Fremantle ..	5	25	5	1 „ 72	58	*g* Oct. 22nd, 1898

(*a.*)—*Via* Smith's Mill—Relaid with 58lb. rails in July, 1893. Present "down" line, Perth-East-Perth in June, 1896. (*b.*)—Duplicated and re-laid with 58lb. rails, extension of 49 chains, opened on 21st October, 1897. (*c.*)—Relaid with 60lb. rails in June, 1893. (*d.*)—Relaid with 60lb. rails in April, 1896. (*e.*)—Line extended 23 chains in 1896. (*f.*)—Exclusive of second line from Bellevue to Midland Junction, now used as a "down" road of double line. (*g.*)—Section from Fremantle to W. A. Smelting Works opened on 9th July, 1898.

Digitized by Google

That portion of this section between Fremantle and Bellevue carries the metropolitan-suburban traffic of the capital of the State, its port, and the suburbs of both. Fremantle, being the principal port of entry into the State, carries, of course, a large through shipping traffic both inwards and outwards for all parts, and is in addition the first and last port of call in Australia for European mail steamers. The line runs eastward to Northam, branching to the South at Spencer's Brook towards the Great Southern district, and serves the agricultural area known as the Avon Valley.

2. Eastern Goldfields Railway, built in the undermentioned sections:—

Subdivision.	Length of Main Line.						Highest Station.		Lowest Station.		Height of Line above Sea.		Steepest Gradnt.	Weight of Rails per yard	Date when opened for Traffic.
	Double.		Single.		Total.		Name.	Height.	Name.	Height	Highst.	Lowest.			
	Mls.	Chs.	Mls.	Chs.	Mls.	Chs.		Feet.		Feet.	Feet.	Feet.		Lbs.	
Northam-Southern Cross..	..		170	01	170	01	Nulla-Nulla ..	1,387	East Northam	489	1,432	489	1 in 60	45 & 58	a. July 1st, 1894
Southern Cross-Boorabbin	..		60	20	60	20	Kgorarawalyee	1,522	Southern Cross	1,163	1,572	1,140	1 „ 60	45	b. July 1st, 1896
Boorabbin-Kalgoorlie ..	23	62	54	28	78	10	Ubini	1,495	Kalgoorlie ..	1,234	1,537	1,192	1 „ 60	45	c. Jan. 1st, 1897
Kalgoorlie-Boulder(Lakeside)	5	30	3	61	9	11	Hannan Street	1,290	Lakeside ..	1,078	1,290	1,078	1 „ 60	60	d. Nov. 8th, 1897
Kalgoorlie-Kanowna ..	..		12	65	12	65	Kalgoorlie ..	1,234	Kanowna ..	1,226	1,320	1,195	1 „ 60	58	June 15th, 1898
Kalgoorlie-Menzies ..	..		80	39	80	39	Bardoc ..	1,411	Gidgi	1,129	1,458	1,124	1 „ 60	58	Feb. 13th, 1899
Brown Hill Loop	..		4	41	4	41	Crœsus ..	1,385	Trafalgar ..	1,315	1,385	1,274	1 „ 60	58	Mar. 17th, 1902
Northam-Goomalling ..	..		30	00	30	00	Goomalling ..	782	East Northam	489	804	484	1 „ 60	45	July 1st, 1902
Menzies-Leonora	..		80	40	80	40	Niagara ..	1,460	Gwalia ..	1,219	1,533	1,167	1 „ 65	58	Jan. 12th, 1903

(a.)—86 miles to 100¼ miles relaid with 58lb. rails, 1897. 76¾ miles to 86 miles and 100¼ miles to 126 miles relaid with 58lb. rails, 1898. 126 miles to 179 miles and 241 miles to 248 miles relaid with 58lb. rails, 1900. 180¼ miles to 191¼ miles relaid with 58lb. rails, 1901. 191¼ miles to 241 miles relaid with 60lb. rails, 1902. (b.)—Relaid with 60lb. rails in 1902. (c.)—Duplicated between Coolgardie and Kalgoorlie, 4th August, 1901. Relaid with 60lb. rails, between Boorabbin and Coolgardie in 1903. (d.)—Duplicated to Kamballie, 28th April, 1901.

Digitized by Google

For about 100 miles East of Northam this line runs through country gradually being settled by an agricultural population, and rapidly gaining favour among selectors. Thence eastward the gold-mining industry provides its principal traffic in the haulage of general goods for the population resident in the various mining localities, machinery, timber, firewood, and other necessities of the gold-mining industries. Towards Leonora good pastoral country, which is being rapidly stocked, is met with, where water of sufficiently good quality for stock purposes is obtained at shallow depths. Throughout the entire section water supply for railway purposes originally had to be provided by conservation in dams or reservoirs, and in times of lengthy intervals between rainfall condensing has been necessary, the department having erected at Coolgardie a condensing plant capable of a daily output of 100,000 gallons. The recently completed Coolgardie Water Scheme, however, is now available from Northam to Kalgoorlie, and renders this section practically independent of the former alternatives of haulage or condensing in dry seasons. Around Kalgoorlie a suburban traffic, as between that place and Coolgardie, Kanowna, and Boulder City is carried.

3.—South-Western Railway.

Subdivision.	Length of Main Line. (* Single.)		Highest Station.		Lowest Station.		Height of Line above Sea.		Steepest Gradient.	Weight of Rails per yard.	Date when opened for Traffic.
			Name.	Height	Name.	Height.	Highest.	Lowest.			
	Mls.	Chs.		Feet.		Feet.	Feet.	Feet.		Lbs.	
Bunbury-Boyanup	16	04	Boyanup ..	122	Bunbury ..	7	125	2	1 in 90	45	a Mar. 12th, 1891
East Perth-Pinjarra	53	28	Beenup ..	197	Pinjarra ..	28	197	11	1 „ 75	46½	May 2nd, 1893
Pinjarra-Picton Junction ..	56	71	Drakesbrook ..	140	Picton Junction	28	140	26	1 „ 75	46½	Aug. 22nd, 1893
Boyanup-Minninup (Donnybrook)	9	58	Donnybrook ..	208	Boyanup ..	122	208	122	1 „ 80	45	Nov. 16th, 1893
Boyanup-Busselton	27	78	Boyanup ..	122	Busselton ..	9	124	7	1 „ 75	45	Dec. 26th, 1895
Canning Racecourse Branch ..	0	46	.. .. ..	..	.. .. ..	..	34	26	1 „ 69	46½	Feb. 22nd, 1896
Bunbury Racecourse Branch ..	1	48	Racecourse ..	16	.. .. ..	..	28	5	1 „ 67	58	Nov. 17th, 1897
Brunswick-Collieffields	25	63	Worsley ..	774	Brunswick Junct.	106	839	105	1 „ 40	60	July 1st, 1898
Donnybrook-Bridgetown ..	42	26	Greenbushes ..	947	Donnybrook ..	208	977	208	1 „ 40	60	Nov. 1st, 1898

(a.)— Relaid with 45lb. rails in August, 1896. * No double line.

Digitized by Google

This section serves some of the oldest agricultural settlements of the State, and passes through country unsurpassed in the Commonwealth. It is, in addition, the principal timber line of the State, extensive jarrah forest concessions being held at numerous points throughout its length, from which timber is consigned to Bunbury, Busselton, and Fremantle for direct export, and to Mundijong (formerly called Jarrahdale Junction) for transfer to a privately-owned line terminating at the port of Rockingham. The whole of the output from the Collie coal mines also affords traffic for this section, and the line is well used by pleasure seekers visiting the health resorts of Mandurah (*via* Pinjarra), Bunbury, and Busselton; near the last-named town is the wonderful caves district, which seems likely to become famous throughout the world.

4.—Great Southern Railway.

(*Beverley–Albany Jetty.*)

Length of Main Line (single)	243 miles.
Highest Station	Narrogin
Height	1,114ft.
Lowest Station	Albany
Height	8ft.
Maximum height above Sea	1,313ft.
Minimum height above Sea	8ft.
Steepest Gradient	1 in 55
Weight of Rails per yard	46½lbs.
Date when opened for Traffic by the Government	Dec 1st. 1896

Constructed by the West Australian Land Co., and purchased by the Government in 1896, this line depends principally upon agriculture for its traffic. Since it became available for the purpose no district in the State has been more rapidly settled and brought under cultivation than has that adjoining the Great Southern Railway, and the results attained from wheat and fruit appear to have given thorough satisfaction to the settlers. Very extensive clearing operations, reaching practically from Beverley to Mount Barker, are now in progress, and there is a prospect of an early export trade developing for which every facility is being provided by the Railway department. Albany is the principal health resort of the S its cool bracing climate being highly invigorating.

Digitized by Google

5.—Northern Railway.

Particulars.	Subdivisions.				
	Geraldton-Northampton.	2-Mile Junction-Walkaway.	9-Mile Junction-Mullewa.	Mullewa-Cue.	Cue-Nannine.
Length of Main Line (Single)	Miles. Chs. 34 17	Miles. Chs. 17 53	Miles. Chs. 57 07	Miles. Chs. 196 48	Miles. Chs. 46 00
Highest Station .. Height .. ft.	Northampton 561	Walkaway 91	Mullewa 905	Lennonville 1,542	Tuckanarra 1,562
Lowest Station .. Height .. ft.	Geraldton 5	Northampton Junction 18	Mullewa Junction 76	Mullewa 905	Nallan 1,389
Maximum height above Sea .. ft.	646	98	976	1,584	1,632
Minimum height above Sea .. ft.	5	18	79	878	1,377
Steepest Gradient ..	1 in 30	1 in 100	1 in 50	1 in 60	1 in 60
Weight of Rails per Yard .. .. lbs.	35	46¼	45	45	45
Date when opened for Traffic	1879 *a* July 26th	1887 July 21st	1894 Nov. 21st	1898 July 1st	1903 June 1st

a. 0 to 2 miles relaid with 46¼lb. rails in July, 1887.

What is now described as the Northampton branch is, in reality, the oldest piece of railway line in the State. Commenced in 1874 originally to serve the then prosperous copper mining industry, this subdivision now carries but little ore, its main source of revenue being derived from service to the squatters, and to the orchardists of the Chapman River district. The line from Geraldton to Walkaway taps the rich wheat growing area known as the Greenough Flats, and connects with the privately-owned Midland Railway at the latter point. The main line is from Geraldton to Nannine, and derives its means of existence from the pastoral industry along its Western half, and from the mining industry of the Murchison goldfield, further East. Fresh water is available by means of wells along this line, but of such quality as to be unsuitable for locomotive purposes. Conservation and condensing are therefore resorted to, though in dry seasons the supplies from the wells have, of necessity, to be used at any cost.

Safe-working Appliances.

The number of stations provided with interlocked signalling is 98 out of 321, and includes all suburban stations and all junctions. In addition to these, the system is being extended as circumstances permit, particularly between the coast and the Eastern goldfields. *traffic on* which line is of a very heavy nature.

Digitized by Google

Although it was only in 1897 that the policy was introduced of improving upon the old staff and ticket system of working by the protection of busy portions of the system by means of interlocked signalling, and of working trains over the single lines by the aid of electric signalling apparatus, that policy has been rapidly pushed forward. The return appended shows the progress effected in these important matters:—

Date to end of	Number of Miles opened for Traffic.			Number of miles of line worked under Absolute Block, or Train Staff and Ticket Systems, under Rules which are in accordance with the Regulations of the Board of Trade, England.					Number and percentage of places which have or have not Points and Signals Interlocked.				
				Double.		Single.		Total.	Number of Places.			Percentage.	
	Double.	Single.	Total.	Sykes' System.	Other Block.	Electric Staff.	Staff and Ticket with Telephone.	——	Inter-locked.	Not Inter-locked.	Total.	Inter-locked.	Not Inter-locked.
June, 1890 ..	..	183	183	..	..	..	..	..	..	32	32	..	All
June, 1898 ..	26	966	992	..	26	343	623	992	29	165	194	14·87	85·13
June, 1899 ..	26	1,329	1,355	..	26	515	814	1,355	55	202	257	21·40	78·60
June, 1900 ..	26	1,329	1,355	..	26	521	808	1,355	66	193	259	25·48	74·52
June, 1901 ..	31	1,324	1,355	1	52	614	687	1,355	76	199	275	27·63	72·37
June, 1902 ..	55	1,305	1,360	2	51	521	786	1,360	91	203	294	30·85	69·15
June, 1903 ..	55	1,461	1,516	2	53	544	917	1,516	98	223	321	30·53	69·47

Digitized by Google

WATER SUPPLY.

The main natural difficulty with which Engineers and management of the Western Australian railways have had to contend has been found in the dryness of practically the whole of the country traversed by their system. Excepting only the South-Western lines, the water supply generally is obtained from dams or reservoirs which are dependent entirely upon the rainfall. In the goldfields districts this proves somewhat precarious, and in view of the absolute water famines which have from time to time occurred, a large condensing plant (as previously referred to) capable of producing 100,000 gallons of water daily, was erected at Coolgardie early in 1899, and although the completion of the Coolgardie Water Scheme has now rendered its future use unnecessary, there have been occasions when the traffic has been maintained only by the use of its condensed water. The statement published hereunder, will convey some idea of the extent to which it has been necessary to go in providing for conservation of water:—

Return of Reservoirs for Railway Water Supply, Year ending 30th June, 1903, arranged in order of Mileage on each line of Railway.

Name of Reservoir.	Mileage of Reservoir. M.	C.	Capacity in Gallons.	Cost of Construction. £	Gravitation or Steam Pump.
EASTERN RAILWAY—					
Midland Junction	22	24	11,500,000	1,354	Steam Pump (from artesian bore.)
Chidlow's Well	39	20	117,000,000	8,803	Steam Pump.
Clackline Junction	61	09	4,000,000	6,798	Do.
Spencer's Brook	70	55	21,112,000	7,797	Gravitation.
Burlong Pool	74	54	28,000,000	..	Steam Pump.
Northam	76	48	11,291,000	7,773	Gravitation.
EASTERN GOLDFIELDS RAILWAY—					
*Cunderdin	114	11	12,200,000	6,798	Do.
Tammin	130	00	94,011,000	12,344	Do.
Kellerberrin	144	11	3,800,000	3,872	Steam Pump.
Merredin	179	52	7,470,000	5,366	Do.
Burracoppin	193	65	8,326,000	6,736	Gravitation.
Bodallin	216	56	16,803,000	8,708	Do.
Parker's Road	233	71	7,081,000	9,131	Steam Pump.
Southern Cross Parsonage ..	247	68	643,200	2,411	Do.
Yellowdine No. 1	268	12	1,112,075	3,270	Do.
" No. 2	268	12	2,907,000	5,966	Do.
Karalee	280	20	10,642,225	15,460	Do.
Koorarawalyee	290	48	1,524,000	3,950	Do.
Boorabbin No. 1	308	04	968,700	15,001	Do.
" No. 2	308	04	4,847,000		
Boondi	313	52	4,845,000	5,994	Do.
Woolgangie No. 1	323	10	1,302,700	3,772	Do.
" No. 2	323	10	5,572,700	5,550	Do.
Bullabulling No. 1	344	30	1,198,000	2,912	Do.
" No. 2	344	30	3,592,000	5,000	Do.

* CUNDERDIN.—This Reservoir was handed over to the Public Works Department (Coolgardie Water Scheme) on 2nd May, 1902, the gross cost of the works, appliances, and appurtenances (£8,329) being written off the Capital Account.

Digitized by Google

Return of Reservoirs for Railway Water Supply, Year ending 30th June, 1903, etc.—continued.

Name of Reservoir.	Mileage of Reservoir.		Capacity in Gallons.	Cost of Construction.	Gravitation or Steam Pump.
	M.	C.		£	
EASTERN GOLDFIELDS RAILWAY—*continued*—					
Broad Arrow	409	40	10,060,800	15,430	Steam Pump.
Bardoc	417	48	2,045,400	13,415	Do.
Goongarrie	440	75	1,048,300	11,193	Do.
†Kanowna	398	60	3,691,800	9,110	Do.
Coolgardie	362	40	500.000	‡	Do.
†Niagara	499	40	38,750,000	61,577	Do.
GREAT SOUTHERN RAILWAY (Albany-Beverley)—					
195-Mile	157	28	7,000,000	‡	Do.
Wagin Lake	203	00	6,500,000	‡	Do.
Tambellup	262	54	7,000,000	‡	Do.
Cranbrook	284	26	2,500,000	‡	Do.
Albany	350	17	120,000	‡	Gravitation.
NORTHERN RAILWAYS (from Geraldton)—					
Mullewa	367	19	3,386,400	8,440	Steam Pump.
Yalgoo	440	65	1,981,100	10,250	Do.
Mount Magnet	517	48	2,882,960	11,168	Do.
Day Dawn	560	68	2,901,150	3,774	Do.

† KANOWNA and NIAGARA.—These Reservoirs are not yet vested in the Commissioner of Railways, nor has the cost of construction been debited to Railway Capital. The Mines Water Supply Branch is credited with payment for water drawn therefrom for railway purposes.

‡ The cost of these Reservoirs was included in the lump sum cost of the Railways on which they are respectively situated.

In addition to the reservoirs shown above, the construction of additional means of conservation has become a question of urgency, particularly so in respect of the water supply between Geraldton and Cue, and in the neighbourhood of Menzies and the extension northwards. A sextuple multiple effect condensing plant for sea water is being laid down at Geraldton, there being no suitable catchment area near that place, and the water obtainable there by means of wells being destructive to locomotive boilers.

Digitized by Google

Results of Working.

The principal results of working since 1st July, 1893, are contained in the table printed below :—

Year ending 30th June.	Average Length of Line.	Number of Passengers.	Tonnage of Goods and Live Stock.	Train Mileage.	Earnings from Coaching Traffic.	Earnings from Goods Traffic.	Total Earnings.	Working Expenses.	Net Earnings.
					£	£	£	£	£
1894 ..	321	617,080	204,686	641,080	64,409	76,155	140,564	103,973	36,591
1895 ..	550	1,022,248	255,839	997,540	122,051	173,949	296,000	182,045	113,955
1896 ..	580	1,679,816	435,855	1,541,750	188 ,765	340,851	529,616	263,705	265,911
1897 ..	830	3,607,486	858,748	2,537,192	420,750	494,733	915,483	577,655	337,828
1898 ..	974	5,669,444	1,203,911	3,613,874	458,402	561,275	1,019,677	786,318	233,359
1899 ..	1,270	5,872,200	1,132,246	3,257,871	364,687	639,933	1,004,620	712,329	292,291
1900 ..	1,355	6,225,068	1,384,040	4,216,161	402,500	857,012	1,259,512	861,470	398,042
1901 ..	1,355	6,823,453	1,719,720	4,126,202	407,319	946,385	1,353,704	1,044,920	308,784
1902 ..	1,356	8,158,299	2,040,092	4,507,919	459,461	1,061,968	1,521,429	1,256,370	265,059
1903 ..	1,434	9,106,396	1,968,331	4,611,315	472,052	1,081,433	1,553,485	1,247,873	305,612

Digitized by Google

These show, in gross, the tenfold increase in receipts and expenditure which has taken place during the last decade. The tonnage figure shows the same remarkable expansion, and the number of passenger journeys had exceeded it. In common with the majority of Australasian railways, statistics as to the ton mileage and passenger mileage are not available, and, consequently, it is not possible to comment upon these. With regard to the tonnages, however, having in mind the increase of the mileage open from 203 miles on 1st July, 1893, to 1,516 miles on 1st July, 1903, it is not impossible to conceive that the ton mileage, if available, would disclose an increase probably unique in the history of the railways of the world. A very large proportion of the traffic is carried for the through run of 385 miles from Fremantle to Kalgoorlie, and the absence of any substantial profitable backloading has a decidedly prejudicial effect on the percentage of working expenses to revenue. The increase in passenger journeys is due in large proportion, probably to the extension of suburban settlement in the neighbourhood of the metropolis of the State, and also in the vicinity of the Boulder group of mines, but there is not the slightest doubt that the average distance per journey would, if the figures were known, be found exceedingly high.

It is, however, by figures of a more condensed nature that the results accomplished can be most readily ascertained, and therefore the table hereunder is published, the period being similar to that previously shown :—

Year ending 30th June.	Earnings per Train Mile.	Working Expenses per Train Mile.	Net Receipt per Train Mile.	% Working Expenses to Gross Earnings
	s. d.¶	s. d	s. d.	%
1894 ..	4 4·59	3 2·90	1 1·69	73·96
1895 ..	5 11·21	3 7·79	2 3·42	61·50
1896 ..	6 10·44	3 5·05	3 5·39	49·79
1897 ..	7 2·59	4 6·64	2 7·95	63·09
1898 ..	5 7·72	4 4·22	1 3·50	77·11
1899 ..	6 2·01	4 4·48	1 9·53	70·91
1900 ..	5 11·70	4 1·04	1 10·68	68·40
1901 ..	6 6·74	5 0·78	1 5·96	77·19
1902 ..	6 9·00	5 6·89	1 2·11	82·58
1903 ..	6 8·85	5 4·95	1 3·90	80·33

The most striking feature of these figures is to be found, perhaps, in the high percentage relation of working expenditure to earnings. It has already been explained that the policy of the Government has been to use the railway system of the State for the development of the State's resources, to the greatest extent consistent with the direct payment by the customers of the Department of the cost of working and interest charges. The tariffs have been modelled and re-modelled from time to time with that object in view, but notwithstanding this, *the Department* has, after payment of all working

expenses and interest charges, been able to hand over to the general revenue a profit varying in amount with the circumstances of the year, and as stated in the table hereunder :—

Year ending 30th June.	Profit on Working.	Total Interest Charges.	Net Profit.
	£	£	£
1895	113,955	85,577	28,378
1896	265,911	94,533	171,378
1897	337,828	138,692	199,136
1898	233,359	178,381	54,978
1899	292,291	221,429	70,862
1900	398,042	235,976	162,066
1901	308,784	243,477	65,307
1902	265,059	252,891	12,168
1903	305,612	274,725	30,887

The figures in the column "Total Interest Charges," include, not only the actual rates of interest payable on moneys expended from the various loans raised by the State, but also provide for a charge of four per cent. per annum on moneys which have been expended from consolidated revenue on railway capital account, particulars of which are stated in a return previously included in this article. (*Vide* page 109.)

Results in relation to Population.

The enterprise of the State and the prosperity of its citizens is exemplified by means of its railway statistics perhaps better than in any other manner. As regards construction and capital expenditure, the figures taken at 30th June, in each year, have been as under :—

Year.	Population at 30th June.	Mileage.		Capital.	
		Miles open.	Population per Mile.	Total Debit.	Per head of population.
				£	£
1894	75,880	321	236	1,169,221	15
1895	89,477	550	163	2,092,372	23
1896	122,308	580	211	2,316,824	19
1897	157,633	830	190	3,734,477	24
1898	170,699	974	175	5,047,261	30
1899	168,128	1,270	132	6,427,370	38
1900	177,784	1,355	131	6,856,363	39
1901	189,226	1,355	140	7,098,239	38
1902	208,325	1,359	153	7,410,426	36
1903	224,311	1,516	148	8,141,782	36

It will be seen that the development of the State has decreased the ratio between mileage open and population very materially, and at the same time more than doubled the responsibility per head as regards the capital figure. Of the £36 per head—the final figure of the above statement—£2 per head represents capital expenditure, which has been charged to the consolidated revenue of the State, and

Digitized by Google

therefore is, in fact, not interest-bearing, excepting only for book-keeping purposes and for use as a criterion of results. The net loan responsibility, on which interest at the general average rate of 3·36 per cent. per annum is payable to the bondholders, amounts to the sum of £34 per head per annum, represents a charge (exclusive of the sinking fund provided for by the Treasury from consolidated revenue, and not treated in the accounts of the Railway Department) of £1 2s. 11d. per head per annum.

Although the debt per head on account of railway construction has risen rapidly, the cost per mile has been kept so comparatively low in Western Australia that the *per capita* responsibility under the similar headings of some of the other States is appreciably higher, while the use made of the railways in this State and the revenue per head of population is probably larger than would be found in any other country throughout the world. Based on the mean population throughout the State during the years respectively referred to, the figures as to the railway traffic per head are contained in the following statement :—

Year ending 30th June.	Mean population for Year shown.	Revenue.		Expenditure.	
		Gross Earnings.	Per head of population.	Working expenses.	Per head of population.
		£	£	£	£
1894 ..	67,198	140,564	2·09	103,973	1·55
1895 ..	82,388	296,000	3·59	182,045	2·21
1896 ..	104,602	529,616	5·06	263,705	2·52
1897 ..	140,592	915,483	6·51	577,655	4·11
1898 ..	164,039	1,019,677	6·22	786,318	4·79
1899 ..	168,959	1,004,620	5·95	712,329	4·22
1900 ..	172,281	1,259,512	7·31	861,470	5·00
1901 ..	181,779	1,353,704	7·45	1,044,920	5·75
1902 ..	197,341	1,521,429	7·71	1,256,370	6·37
1903 ..	216,197	1,553,485	7·19	1,247,873	5·78

Year ending 30th June.	Passengers.		Goods.	
	No. of Passenger journeys.	Per head of population.	Tonnage of Goods and Livestock.*	Per head of population.
	No.	No.	tons.	tons.
1894 ..	617,080	9·18	204,686	3·05
1895 ..	1,022,248	12·41	255,839	3·11
189 ..	1,679,816	16·06	435,855	4·17
1897 ..	3,607,486	25·66	858,748	6·11
1898 ..	5,669,444	34·56	1,203,911	7·34
1899 ..	5,872,200	34·76	1,132,246	6·70
1900 ..	6,225,068	36·13	1,384,040	8·03
1901 ..	6,823,453	37·54	1,719,720	9·46
1902 ..	8,158,299	41·34	2,040,092	10·34
1903 ..	9,106,396	42·12	1,968,331	9·10

* These figures include the whole traffic hauled (i.e., material for maintenance, locomotive fuel, etc.), whether productive of revenue or not

Digitized by Google

A traffic equivalent to a payment of £7 3s. 9d. for each man, woman, and child living in the country must surely be regarded as phenomenal, and as an index of the great prosperity of the country wherein it occurs. It has, however, been reached by a steady and consistent growth, and may perhaps be regarded, in a measure, as the result of the geographical conditions of the State, and the location of the principal industry—gold-mining—at such a long distance from the coast and present centres of agricultural production. Although the figures in question cannot be expected to continue expanding, or even to remain at their present abnormal proportion, their reduction can only, so far as the indications of the present and the experience of the past may be relied upon, be effected by a considerable increase in the population of the agricultural districts, whose business and habits do not lead proportionately to so heavy a railway traffic as do those of a population engaged almost exclusively in mining pursuits and their attendant requirements.

Classification of Traffic, Revenue, and Expenditure.

The information afforded hitherto has dealt principally with the main features of the railway system, and has avoided detailed results as far as practicable. It is not expedient, however, to omit all reference thereto, and the returns hereunder will, it is hoped, give as much information in that respect as can be found place for in an article of this nature.

Taking the result of the four latest financial years, the classification of receipts has been as follows:—

Receipts.	1899–1900.	1900–1901.	1901–1902.	1902–1903.
	£	£	£	£
Passengers	342,468	341,479	381,295	380,722
Parcels, Horses, Carriages, etc.	38,347	41,486	48,798	56,510
*Cloak Room	..	..	3,218	2,774
*Mails	..	..	8,408	9,671
Goods and Minerals ..	769,058	837,948	939,418	953,431
Livestock	28,380	32,631	31,266	30,446
Wharfage and Jetty Dues ..	49,058	59,253	66,416	62,663
*Rents	..	..	12,421	15,167
Miscellaneous	32,201	40,907	29,189	42,101
Total	1,259,512	1,353,704	1,521,429	1,553,485

*During 1899-1900 and 1900-1901 receipts from these sources were included with Miscellaneous. Had a similar course been followed in 1901-1902 that item would have totalled £54,236 16s. 7d.

Digitized by Google

The figures as to wharfage and jetty dues are interesting as conveying an approximate idea of the increases in the sea-borne commerce of the State, the rate charged and general conditions having remained the same throughout the period in question. Incidentally, it may be stated that from the 1st of January, 1903, the operation and control of the Fremantle wharves and jetties, of which the Commissioner of Railways was formerly the custodian on behalf of the Government, have been vested in a Board of Commissioners, known as the Fremantle Harbour Trust, who, from the date named, have collected all revenue derived from the shipping facilities of the harbour.

The above statement dealing with the pecuniary classification, however, needs supplementing by some figures as to the manner in which it is derived, and for that reason the following broad divisions of the traffic are quoted :—

Divisions.	1899–1900.	1900–1901.	1901–1902.	1902–1903.
Tonnage of General Goods ..	1,364,429	1,697,854	1,866,794	1,773,637
Tonnage of Livestock ..	19,611	21,865	21,352	21,382
Number of First-class Passengers	1,164,872	1,402,493	1,793,177	1,961,664
Number of Second-class Passengers	5,060,196	5,420,960	6,365,122	7,144,732
Total Number of Passengers	6,225,068	6,823,453	8,158,299	9,106,396

The tonnages of goods for 1899-1900 and 1900-1901 include the whole work of that class performed by the Department, goods carried without charge for the use of the railway (such as locomotives fuel, maintenance material, etc.) not having been separated therefrom until 1901-1902, when approximately 154,946 tons of such traffic were included in the total figure. For all practical purposes, a similar proportion may be taken as having reference to the similar total

Digitized by Google

figures of the preceding years. Details of the gross tonnages are as follows:—

Description of Goods.	1899–1900.		1900–1901.		1901–1902.		1902–1903.	
	Weight.	Per cent. of Total.	Weight.	Per cent. of Total.	Weight.	Per cent. of Total.	Weight.	Per cent. of Total.
	tons.		tons.		tons.		tons.	
Coal, Coke, and Shale	149,309	10·94	184,636	10·88	184,373	9·13	194,731	10·00
Ores	67,331	4·94	59,809	3·52	59,969	2·97	73,411	3·77
*Other Minerals	237,977	17·44	280,062	16·50	391,833	19·41	375,061	19·27
Wool	1,947	0·14	2,170	0·13	2,036	0·10	2,321	0·12
Hay, Straw, Chaff	53,125	3·90	54,786	3·22	60,969	3·02	70,768	3·64
Grain (all kinds) and Flour	52,591	3·86	59,427	3·50	59,220	2·93	57,849	2·97
Potatoes	13,407	0·98	10,007	0·59	9,407	0·47	10,319	0·53
Firewood	273,715	20·06	413,552	24·36	604,034	29·92	525,058	26·97
Timber (locally-grown)	244,362	17·91	264,067	15·55	335,065	16·60	328,130	16·85
Timber (imported)	13,934	1·02	15,050	0·88	11,396	0·57	25,653	1·32
Machinery	51,104	3·74	50,322	2·97	31,239	1·55	14,983	0·77
Dairy Produce (including milk, butter, cheese, and eggs)	9,061	0·66	7,908	0·47	10,657	0·53	15,580	0·80
Fruit, (other than dried or preserved)	2,735	0·20	2,542	0·15	4,338	0·21	4,955	0·25
All other goods not classified above ..	193,831	14·21	293,516	17·28	254,204	12·59	248,130	12·74
	1,364,429	100·00	1,697,854	100·00	†2,018,740	100·00	‡1,946,949	100·00

*Other minerals includes bricks, road metal, ballast, clay, ironstone, lime, limestone, rough stone, etc.

† This total includes the undermentioned tonnages carried free for Departmental use:—

Coal for Loco. Branch	138,091	tons
Rails, sleepers, etc., for Way and Works Branch ..	13,855	„
Total	151,946	„

‡ This total includes the undermentioned tonnages carried free for Departmental use:—

Coal for Loco. Branch	143,635	tons
Rails, sleepers, etc., for Way and Works Branch ..	29,677	„
Total	173,312	„

Digitized by Google

It is of interest to note that by far the largest item is firewood, and to observe the annual increases under that heading, which in 1901-1902 represented practically one-third of the gross tonnage. The gold-mining industry is, of course, the largest consumer of this commodity.

Turning to the reverse side of the ledger, we find the following figures relating to expenditure:—

Service.	1899–1900.	1900–1901.	1901–1902.	1902–1903.
	£	£	£	£
*Loco., Carriage, and Wagon Charges	406,565	497,188	670,485	642,808
Permanent Way, Works and Buildings	160,264	193,573	215,320	231,970
Traffic and Jetty Expenses	252,750	296,045	306,409	312,364
Compensation (Goods and Coaching)	4,455	6,926	7,246	4,808
Electrical	18,805	21,838	25,303	27,031
Signalling and Interlocking	4,027	6,040	6,307	6,547
Generally	14,604	21,310	25,300	22,345
Totals	861,470	1,044,920	1,256,370	1,247,873

* These figures include charges for replacing and rebuilding locomotives and rolling stock, as referred to on page 126.

These represent the gross or bulk divisions of the total amount, and call for little comment with the exception of the high proportion of the expenditure under "locomotive, carriage, and wagon charges," which are dealt with in detail elsewhere in this article. The "compensation" item is admittedly high in comparison with the corresponding expense in other parts of the Commonwealth, and is due, generally speaking, to the conditions of a new country which still obtain to a large extent in Western Australia; not only is the staff, to a certain extent, inexperienced—or, at all events, of less average experience—than would be the case with railways of older establishment, but at the same time the comparatively abundant opportunities of employment in other industries deprive the word dismissal of a good deal of the disciplinary effect which it has in less prosperous States, and, therefore, carelessness cannot be so rigorously guarded against, as might otherwise be the case.

Digitized by Google

The division per mile open in the respective years has been as shown hereunder :—

Service.	1899–1900.		1900–1901.		1901–1902.		1902–1903.	
	£	s.	£	s.	£	s.	£	s.
*Loco., Carriage, and Wagon Charges	300	1	366	19	494	9	448	5
Permanent Way, Works and Buildings	118	5	142	17	158	16	161	15
Traffic and Jetty Expenses ..	186	11	218	10	225	19	217	17
Compensation	3	6	5	2	5	7	3	7
Electrical	13	18	16	2	18	13	18	17
Signalling and Interlocking	2	19	4	9	4	13	4	11
Generally	10	15	17	4	18	13	15	12
Totals	635	15	771	3	926	10	870	4

* These figures include charges for replacing and rebuilding locomotives and rolling-stock, as referred to on page 126.

The cost per mile open has naturally expanded with the degree in which the use of that mile has increased, though for that matter, perhaps the cost per train mile, given hereunder, affords a better criterion :—

Service.	1899-1900.		1900-1901.		1901-1902.		1902–1903.	
	s.	d.	s.	d.	s.	d.	s.	d.
Loco., Carriage, and Wagon Charges ..	1	11.15	2	4.92	2	11.70	2	9·46
Permanent Way, Works and Buildings ..	0	9.12	0	11.26	0	11.46	1	0·07
Traffic and Jetty Expenses	1	2.39	1	5.22	1	4.31	1	4·26
Compensation	0	0.25	0	0.40	0	0.38	0	0·25
Electrical	0	1.07	0	1.27	0	1.35	0	1·41
Interlocking and Signalling	0	0.23	0	0.35	0	0.34	0	0·34
Generally	0	0.83	0	1.36	0	1.35	0	1·16
Totals	4	1.04	5	0.78	5	6.89	5	4·95

* These figures include charges for replacing and rebuilding locomotives and rolling-stock, as referred to on page 126.

This table emphasises the increase in the expenditure of the Locomotive Branch as previously referred to, and without which increase the total cost during 1901-1902 would have been less than during the preceding year. The increase in total cost is also attributable, in part, to the larger train loads now hauled by the heavier engines recently placed on traffic, combined with the larger proportion of paying load to tare of wagons, which has been the outcome of the policy of the Department. On 1st July, 1900, the basis of computation of train mileage was modified to coincide with the practice agreed upon to be adopted throughout Australasia, and for that reason the figure for 1899-1900 is not of much service as a basis of comparison, though it is included to complete the period used throughout this paragraph.

Digitized by Google

Facilities for Travel.

The figures relating to passenger receipts show that the travelling propensities of the Western Australian public are very much in evidence; and every encouragement is offered by the Department to all classes of the community to still further stimulate them. During the whole summer, and on every occasion of general holiday making, excursion fares at the lowest possible rates are brought into operation to enable the public to travel at the minimum expenditure between the various centres of population and the numerous holiday-making resorts. The children of the goldfields are particularly catered for in this respect; and the efforts of the Goldfields Fresh Air Leagues are backed up by the quotation of return fares of 10s. per child, in parties of ten, from the Murchison Goldfields to Geraldton, and 20s. per child from the Eastern Goldfields to the coastal watering places—Albany, Busselton, or Bunbury—whilst one adult attendant per party of ten children is carried at twice the child's fare. It is felt that by these means the Department is directly furthering the efforts of private philanthropy towards the maintenance of the health and the building up of the constitutions of the younger members of the community.

Development of Industries.

Similarly, the Department is attempting to assist in the encouragement of land settlement, and the development of all industries connected therewith, by the quotation of specially low rates on the various classes of goods used by settlers for clearing, improving, and opening up their land. Machinery for mining purposes also occupies a very favourable position in the rate classification; and native coal and timber are carried at rates which represent very little excess over the total cost of the services therefor rendered. In point of fact, the whole basis of the Rate Book is, as previously mentioned (page 135), the development of the State's resources at charges representing direct payment by the customers of the cost of transit and interest on construction of the plant provided by the State.

Digitized by Google

PRIVATE RAILWAY LINES.

All the private lines in the State are built, like those constructed by the Government, on the 3ft. 6in. gauge. The following table, for the year 1901, gives particulars, as far as obtainable, of all private railways in Western Australia:—

Name.	Length of Line.	Passengers carried.	Goods carried.	Train Miles run.	Sidings.	Locomotives.	Passenger Carriages.	Goods Trucks (opened or covered).	Brake Vans.	Capital expended up to 31st December, 1901.
	Miles chs.	Number	Tons.	Miles.	Number.	Number.	Number	Number	Number	£
Midland Railway	277 0	30,000	(a) 52,246	214,972	21	10	10	(b) 146	10	1,999,006
Collie Mills Railway	5 0	(c)	(c)	(c)	3	1	.	6	..	2,943
The Jarrahdale Jarrah Forests and Railways, Limited	60 0	(c)	(c)	(c)	(d) 24	3	..	170	..	75,000
Karridale Railways	39 0	(c)	(c)	(c)	11	4	2	200	..	55,000
W.A. Goldfields Firewood Supply Tramway	32 0	..	(e) 197,800	(c)	4	4	..	13	1	50,000
The Westralian Jarrah Forests, Ltd., Railway	5 30	..	885	350	1	1	..	4	..	6,127
Wonnerup Railway	24 0	880	13,048	16,940	3	2	1	9	..	28,000
Torbay Junction-Denmark Railway ..	53 20	3,000	55,000	41,000	15	5	1	121	1	120,000
Mornington Mills Railway	16 40	..	(f) 54,775	35,056	4	1	..	52	..	40,000
Railway	33 0	..	2,000	53,000	25	4	..	91	..	50,000
Hoop and Ridgway Siding	0 60	..	3,756	..	1	..	..	..	..	1,000
alup Railway	14 0	..	..	..	4	..	..	12	..	5,000
Railway	18 0	..	..	66,000	7	3	..	45	1	35,000
Darling Range Railway	35 0	4,000	61,200	49,000	21	4	..	64	1	(c)
n River Railway	16 24	..	2,500	1,500	4	1	..	12	..	(c)
Total	629 14	(c)	(c)	(c)	148	43	14	945	14	(c)

114,353 head of live stock also carried. *b.* Including 56 live stock trucks. *c.* Information not available. *d.* Including 20 log sidings. *e.* Firewood. *f.* Including timber, round and sawn. † No return supplied for 1901, figures taken from 1900 Returns.

Digitized by Google

Midland Railway.—The Midland Railway of Western Australia starts from the Midland Junction, 10 miles from Perth, on the Eastern Railway, and runs Northwards, *via* Gingin, to Walkaway, a distance of 277 miles, where it joins the Government line running to Geraldton. It was constructed under a concession on the land grant system, the company receiving 12,000 acres of land for every mile of railway. There are 277 miles of telephone in connection with this railway.

The *Jarrahdale, Karridale, Wonnerup, Torbay, Mornington, Yarloop, Quindalup, Upper Darling, Waroona,* and *Ferguson River Railways* are now all the property of "Millar's Karri and Jarrah Company (1902) Limited."

Jarrahdale Jarrah Forests and Railways, Ltd.—This line was constructed by the Jarrahdale Timber Company under a special timber concession agreement. It consists of a line from Rockingham to Jarrahdale, a distance of twenty-three miles from Rockingham, thence continuing from Jarrahdale inland in different directions to the various mills, making a distance of 60 miles. The telephone line in connection with this railway is 33 miles long.

Karridale Railways.—Under special timber concessions and other leases the *M. C. Davies' Karri and Jarrah Company, Limited,* has constructed lines from Hamelin Harbour and Flinders Bay to the mills at Karridale, Boyanup, and Jarrahdene, with branches into the forest, of a total length of about 59 miles. The telephone lines are about 40 miles long. The Company has erected substantial jetties, put down secure moorings, and surveyed and buoyed the harbours both at Hamelin and Flinders Bay. At the latter place a depth of water of 30ft. is provided for at lowest neap tides.

Wonnerup to Darling Range Railway.—The line from Wonnerup (six miles from the port of Busselton) to the Jarrah Wood and Sawmills Company's Timber Station is 24 miles long. It is proposed to ultimately extend the line to St. John's Brook, and thence to Lower Blackwood.

Torbay Junction-Denmark Railway.—Messrs. Millar's Karri and Jarrah Forests, Limited, have, under a special concession, constructed a line of railway of standard gauge, on the land grant system, from a point 10 miles from Albany on the Great Southern Railway to Torbay, a distance of 12 miles, and further continued the railway on to Denmark Mills, a distance of 28 miles from Torbay Junction; in addition there are 26 miles of railway extending out into the bush, over which the logs are brought to the mills. There are four mills, where employment is found for 400 men, 170 horses, and 110 bullocks. Five locomotives and 130 trucks are employed in the carriage of sawn timber. There are also 44 miles of private telephone line.

Mornington Mills Railway.—The same Company have 16½ miles of railway at Mornington, with 24 main line trucks, 28 log wagg

2 ballast wagons, 2 locomotives, 105 horses, 253 men, and 7 miles of private telephone line.

Yarloop Railway.—At Yarloop, Millar's Karri and Jarrah Forests, Limited, have constructed 33 miles of railway line, fully equipped with two locomotives, one small Baldwin locomotive, and 49 main line trucks, 44 log wagons, four ballast wagons, and one store van. There are four saw-mills on the concession, employing 350 men and 174 horses. There are 13 miles of private telephone lines. This line leaves the South-Western Railway at Yarloop, a place 78 miles South from Perth, and then runs Easterly over the Darling Range.

Quindalup Railway.—Under H. J. Yelverton's special timber concession at Quindalup, 8½ miles of line have been constructed, connecting the mills with the Port (10 miles West of Busselton), and this line has been extended from the mill into the forest for 5½ miles. A substantial jetty, 700 feet in length, has been constructed at the Port by the Government. The mills are owned by the Imperial Jarrah Wood Corporations, Ltd.

Upper Darling Range Railway.—This line, which until recently was the property of the Canning Jarrah Timber Company, has, with the exception of about 4½ miles at its far end, been purchased by the Government. Starting just outside the Midland Junction Station on the Eastern Railway, it runs to the Canning Timber Station, a distance of about 20 miles. On the first section occurs the Zig-Zag; and near the top of the range, at a height of about 926 feet, is situated the station and village of Kalamunda, where the bulk of the strawberries sold in the local market are produced. Along the line are several brick-making establishments; also a large stone quarry for road metal; whilst several firewood companies also have their depots. Recently, in the immediate vicinity of the line, a comparatively large area of land has been planted in orchards, etc. From Pickering Brook, where the Government line ends, to the Canning Mills the line remains the property of the Canning Jarrah Timber Company, who have also several branch lines into the forest for log-hauling purposes.

Waroona Railway.—The present length of this line is about 25 miles. Two locomotives are owned, and there is a telephone line along the whole length of the railway.

Ferguson River Railway.—This line leaves the Government railways at Dardanup railway station, 128 miles from Fremantle, on the Bunbury-Bridgetown line. The line is worked by the Canning Jarrah Timber Company, Limited, and runs up the Ferguson River Valley to the Wellington Timber Station, a distance of 15 miles. At this station the Canning Jarrah Timber Company have a large and completely fitted up hardwood mill, the output from which runs to nearly 2,000,000 feet of timber per month. The whole of the refuse from this mill is dealt with by automatic machinery; the

Digitized by Google

firewood being removed by patent elevators, and the sawdust blown into the fires by means of immense fans.

The Westralian Jarrah Forests, Ltd.—The property owned by this Company consists of a forest of jarrah timber, situated near Greenbushes, and contains an area of over 80 square miles. It has a large frontage to the Government main railway line. The Company have two saw-mills, which are connected with the Government railway by a private line, two miles long; from the mills into the bush further lines are laid down about three miles in length. The export trade of the Company is mainly carried on from the port of Bunbury, which is within easy access.

Dyke and Ridgway Siding.—This line now belongs to the Coolgardie pressed Brickworks Company. It leaves the Government line near Coolgardie station, connects with the brickworks belonging to the Company, and is used for the transport of bricks only. The total length is about ¾-mile, and the line was constructed at a cost of about £1,000. Off this siding the Government have taken two branches for the purpose of supplying firewood to the large condensers.

GOVERNMENT TRAMWAYS.

The Government possesses 8½ miles of horse tramway between Cossack and Roebourne, which is at present worked at a loss by the Railway Department. The Commissioner of Railways, in his last two reports, has expressed the opinion that it would be to the advantage of his Department if it ceased to have anything whatever to do with this tramway. The Government also owns short tramways at the following places:—Derby, 2½ miles; Wyndham, 18 chains; Broome, 2 miles; Port Hedland, 24 chains; Balla Balla, 18 chains; Onslow, 4 miles 16 chains; Maud's Landing, 33 chains; Carnarvon, 3 miles 2 chains; Dongara, 716 yards; Hopetoun, 396 yards; and Esperance, 1 mile 177 yards. All these are privately leased.

PRIVATE TRAMWAYS.

There are now three Western Australian towns that enjoy the benefit of electric tramways, namely, Perth, Kalgoorlie, and Boulder. Their introduction is also contemplated at Fremantle. The Perth Electric Tramway Company made its line available for public use in 1899. It has since extended its connections to Subiaco, Leederville, North Perth, and to Point Lewis, with a view to its probable future extension in South Perth. On the 31st December, 1902, there were 16½ miles of line open, the cost of construction and equipment to that date having been £380,861. The gross receipts for the preceding financial year had been £54,853, whilst the working expenses amounted to £31,323. The miles run during the year numbered 788,120; the number of passengers carried was 4,410,464. The Company, at

Digitized by Google

the end of the year, possessed 30 cars. The Kalgoorlie Electric Tramway Company opened its line in 1902. On the 30th June, 1903, the number of miles worked was 15½, whilst the cost of construction and equipment to the same date had been £150,380.

PROPOSED TRANSCONTINENTAL RAILWAY FROM KALGOORLIE, IN WESTERN AUSTRALIA, TO PORT AUGUSTA, IN SOUTH AUSTRALIA.

(*Summarised from the Report of the State Engineers-in-Chief.*)

With regard to the proposed connection by railway of Western Australia with the Eastern States, the information available has been condensed, and the principal points summarized, in the final report (27th August, 1903) of the Engineers-in-Chief of the five Australian States of New South Wales, Victoria, Queensland, South Australia, and Western Australia, who met together to consider and discuss the arguments both for and against the scheme.

From the report above mentioned, it appears that the route preferred by the South Australian Government is the one *via* Tarcoola. It is recommended that the standard gauge of 4ft. 8½in. be adopted; and it is understood that there is no objection on the part of the Western Australian Government to the introduction of the proposed gauge; in fact, the laying of a new line of this width on the Fremantle-Kalgoorlie railway track has already been arranged for, so soon as the transcontinental line shall be agreed to.

The probable expenditure in connection with the construction of the transcontinental line is estimated at £4,559,000. This estimate is based on the conditions that the length of line is about 1,100 miles, and that it must be so constructed as to permit of high rates of speed; consequently allowance must be made for a well ballasted road, with rails 70lbs. to the yard, and for a ruling grade not more severe than 1 in 80. A branch line to Eucla will also have to be made for the purposes of construction, and the jetty at that port strengthened and lengthened to permit of the landing of locomotives and of necessarily large quantities of rails and sleepers.

The probable revenue which may be depended upon immediately after construction is estimated at £205,860 per annum. If the past progress in Western Australia is maintained, so that the present population becomes doubled in ten years after completion, the revenue may also be taken as double, viz., £411,720. The compilers of the report state that they were particularly careful not to over-estimate the revenue. The certain competition of steamers in bidding for the conveyance of passengers and freight has to be allowed for, but the continuance of Western Australian prosperity is the controlling factor. There at present exists a very large move-

Digitized by Google

ment of population between the Eastern States and that of the West, which appears to be still increasing, and likely to continue so. That this movement will be encouraged by the additional facilities of railway communication, cannot be doubted; and the bringing of the Eastern goldfields of Western Australia into nearer connection with Adelaide, and consequently the whole of the Eastern States, must result in an ever-increasing passenger traffic; thus the revenue may prove to be higher than estimated, and the deficiency may tend to diminish from year to year more rapidly than has been assumed. It will be for the Commonwealth Government to decide whether the immediate pecuniary loss is so serious as to outweigh the ultimate beneficial effects.

The probable annual expenditure in working and maintaining the line immediately after construction is estimated at £114,400 which, added to interest on the cost of construction, at 3½ per cent.—£159,566—gives £273,966 for the total expenditure. After 10 years, under the conditions stated, the working expenses may be taken as £210,000, and, in view of the necessary expenditure in improving works in the meantime, the interest on the enlarged capital will be £183,501, making a total of £393,501.

The time to be allowed for the completion of the line, in the opinion of the authorities quoted, is four years.

In conclusion, the report summarises the benefits likely to accrue from the realisation of the scheme in the following words:—

"The chief effect of the construction of the Transcontinental Railway would be to draw the Eastern and Western States into closer relationship politically, commercially, and socially.

"The feeling of the community of interests engendered by the establishment of the Commonwealth would be more steadily and satisfactorily maintained, and in case of foreign attack, when communication by sea, if not cut off altogether, might be precarious, a safe and rapid means of conveying men, arms, and ammunition from one side of the continent to the other would be invaluable.

"There would be a saving of time of two days in the delivery of mails between East and West. The railway would enable despatches and communications to be expedited, which is a matter of immense importance both from a business and social point of view. It would greatly induce travel, and many people who shun the discomforts of the sea trip, or cannot afford the extra time involved, would readily take advantage of the railway.

"The saving of time would be more than doubled when return mails between Europe and the Eastern States are considered.

"The saving of time between Fremantle or Perth and the Eastern States is small compared with that between Kalgoorlie and the Eastern States. The journey from Kalgoorlie to Adelaide now requires five days, whereas it would then be done in 36 hours by the railway.

Digitized by Google

"It may be expected that the food supply of the goldfields would be better and cheaper, as the result of the construction of the railway. The cost of living is now very high in that district, and, in consequence, miners and others do not reap that benefit from their high wages which might be expected. On the other hand, were the cost of living reduced, wages might come down without any hardship to the men, and enterprise would be stimulated.

"The present telegraph line runs for the greater part of its length through uninhabited country, and its maintenance is carried on under great difficulties. Were the railway constructed, a better, more accessible, and more easily maintained line could be made available, which could be duplicated as required, and payment for the use of the submarine cable, in consequence of interruption or inadequacy of the land line, would be obviated.

"New tracts of country would be opened up for pastoral settlement both in South Australian and Western Australian territory, the chief difficulty at present lying not so much in the want of fertility of the country and the absence of water as in its inaccessibility.

"The same may be said as regards mineral development. Recent discoveries show that the country for 175 miles East of Kalgoorlie, which is auriferous, may turn out to be highly productive, and a source of revenue to the railway. Tarcoola, and other mining centres in South Australia, if rendered more accessible, may come to enjoy prosperity after they have been more thoroughly and systematically prospected. The reports of the Government Geologist are not unfavourable.

"We are of opinion that South Australia will gain by the construction of the railway. Not only will the railway revenue receive an impetus, and, as before indicated, opportunity for pastoral and mining development be afforded, but the State generally must be benefited by the increase of passengers and other traffic which will come with the railway. We think that if there is any fear of Adelaide ceasing to be a port of call, this could be met by inserting a stipulation in the next mail agreement that the steamers should call there."

Digitized by Google

5.--POSTAL SERVICE.

Universal Postal Union.

Western Australia, as forming a portion of Australasia, entered the Universal Postal Union on the 1st of October, 1891. The various colonies comprising Australasia having endeavoured, unsuccessfully, to induce the Union to allow each colony to be separately represented, an arrangement was finally come to by which Australasia, comprising the usual eight colonies, was to be treated as one country at the International Conference, each colony being, however, allowed to regulate its own tariff, provided it was in accord with the provisions of the Union so far as International Postage was concerned.

The result was that the postage charged on letters received from, and despatched to, all Foreign countries was reduced from 6d. (and in some cases 8d.) to 2½d. (the Union charge) per ½oz.; whilst a corresponding reduction was also made on newspapers and packets.

On 1st January, 1901. Western Australia became one of the six States of the Commonwealth of Australia, under which the six separate Post and Telegraph Departments were amalgamated into one Federal Office.

English, Foreign, and Interstate Mails.

The English and Foreign mails arrive and depart weekly at and from the Port of Fremantle. They have, since August 13th, 1900, been landed at Fremantle, in lieu of Albany, the original port of call. The P. & O. and Orient Companies' steamers call alternately, conveying the weekly homeward and outward mails; and those of the Messageries Maritimes and the N.D.L. Companies, which are under contract respectively with the French and German Governments to convey mails monthly between Marseilles and New Caledonia and between Hamburg and Sydney, also call at Fremantle with a small mail from the Continent of Europe; and letters are therefore in addition forwarded by these steamers, provided they are so superscribed.

The interstate mails are conveyed regularly weekly by the P. & O. and Orient Contract steamers, and also in the form of supplementary mails by the non-contract vessels of the Adelaide S.S., A.U.S.N., Howard Smith, McIlwraith McEacharn, Huddart Parker, and Melbourne Steamship Companies, thus giving at least three regular weekly mails from and to the Eastern States.

Digitized by Google

After leaving Fremantle, all the outward mail steamers call at Adelaide, where the mails are landed, and thence conveyed to their ultimate destination by rail.

Fremantle has, since 1900, been made the first and last port of call for the large ocean-going mail steamers, as during that year the first steamer from the Eastern States arrived on the 13th August, and the first from London on the 12th September.

The mail service between Europe and Australia, under the present contract with the P. & O. and Orient Companies, which expires on the 31st December, 1904, is in many respects considerably improved. The two Companies receive the same annual subsidy they received before, viz., £85,000 each, or jointly a total of £170,000; and of this amount the English Post Office pays £95,000, leaving the six Australian States, which are parties to the contract, to pay the balance, viz., £75,000, the proportion of the contribution payable by each being calculated on the basis of their respective populations.

Western Australia had, up to the end of 1902, paid as her share :—

	£
1888	1,529*
1889	999
1890	895
1891	1,063
1892	1,212
1893	1,317
1894	1,435
1895	1,755
1896	2,131
1897	3,299
1898	3,242
1899	3,262
1900	3,327
1901	3,339
1902	3,414
Total	£32,219

* This amount includes payment for two months under the old contract.

European Mail.—The outward mails are due at Fremantle on Thursday; they, however, frequently arrive on Wednesday, and even as early as Tuesday in each week. The time of their probable arrival at Fremantle is cabled from Colombo. The steamers generally stay in port about six hours. The homeward mails, that is, the mails to England, Europe, etc., close at Perth, as a rule, each Monday; whilst the outward mails, mainly those to the Eastern States, vary according to the date on which the steamer is expected to arrive from Colombo.

The average time taken in the conveyance of the mails from London to Fremantle is 27 days, and from Fremantle to London 27½ days.

Travelling Post Office.—A travelling Post Office Van now runs between Perth and the Eastern Goldfields with interstate and also *local mails.*

Digitized by Google

Postal Returns.

There were, at the end of 1901, 187 Post and Telegraph Offices in Western Australia, or one to every 1,042 inhabitants. The cost of the conveyance of inland mails during 1901 was £39,195 exclusive of the Coastal steam service, which cost £6,137. At the end of the year 1901 the total staff of the Postal and Telegraph Department numbered 1,308 persons, the number being 1,330 at the end of 1902.

On the 31st December, 1902, the number of Post and Telegraph Offices had, however, increased to 197, or one to every 1,092 inhabitants. The conveyance of inland mails had been reduced to £37,432, and the Coastal Steam service increased to £10,385.

Return of Post and Telegraph Revenue and Expenditure for Years 1898 to 1902.

	1898.	1899.	1900.	1901.	1902.
Post and Telegraph Revenue ..	£203,722 ..	£203,962 ..	£206,475 ..	£218,818 ..	£232,591
Post and Telegraph Expenditure ..	£267,108 ..	£230,700 ..	£248,877 ..	£251,289 ..	£257,283

Postal Returns, 1893 *to* 1902.

Year.	No. of Post Offices.	* Despatched and Received.			
		Letters and Post-Cards.	Newspapers.	Packets and Parcels.	Total Postal Matter.
1893	100	7,148,614	6,001,946	1,401,146	14,551,706
1894	111	11,564,697	9,375,589	3,143,008	24,083,294
1895	121	18,141,567	17,996,387	4,079,368	40,217,322
1896	150	27,900,251	17,059,556	4,467,814	49,427,621
1897	178	12,933,000	6,744,536	3,984,866	23,662,402
1898	171	13,429,700	7,390,294	3,262,262	24,082,256
1899	165	12,973,553	6,287,018	3,015,995	22,276,566
1900	178	13,621,695	6,992,278	3,449,779	24,063,752
1901	187	17,450,878	7,975,208	4,421,672	29,847,758
1902	197	18,151,012	9,916,544	5,164,034	33,231,590
Increase for 1902	10	700,134	1,941,336	742,362	3,383,832

* The figures for 1897 and subsequent years represent the actual numbers posted, each letter, packet, post-card, or newspaper counted only once; whereas in the returns for 1893 to 1896 inclusive, each was counted once for every office through which it passed.

Digitized by Google

Statement showing the number of Letters, Newspapers, Books, Post-cards and Packets that passed through the Post Office of the State during the years 1900 *to* 1902 :—

	1900.	1901.	1902.
Letters.			
Inland Letters received and forwarded	8,254,199	11,749,895	12,244,232
Foreign Letters received and forwarded	2,289,077	2,941,130	2,952,099
Letters for transmission out of the State received and forwarded	2,336,265	2,023,864	2,012,724
Totals	12,879,541	16,714,889	17,209,055
Post-Cards.			
Post-Cards received and forwarded ..	* 459,337	* 430,292	* 588,435
Newspapers.			
Local Newspapers received and forwarded	2,290,288	2,891,166	4,621,341
Foreign Newspapers received and forwarded	3,428,361	4,085,102	4,249,740
Newspapers for transmission out of the State received and forwarded ..	1,273,629	998,940	1,045,463
Totals	6,992,278	7,975,208	9,916,544
Packets.			
Local Packets received and forwarded	2,097,076	3,007,408	3,684,376
Foreign Packets received and forwarded	598,170	831,803	872,209
Packets for transmission out of the State received and forwarded	717,970	547,814	571,081
Totals	3,413,216	4,387,025	5,127,666
Parcels			
Posted for places beyond the State ..	10,374	7,781	8,595
Received from places beyond the State	26,189	26,866	27,773
Totals	36,563	34,647	36,368
Registered Letters.			
Registered Letters received and forwarded	282,817	305,697	353,522

* The numbers of Post-Cards received from places beyond the State are included under other heads, principally under "Newspapers."

Postal Notes.

Postal Notes have been in use in this State since June, 1887. They are negotiable within the boundaries of the Commonwealth, and are payable to bearer, at all Post Offices, if presented within the usual office hours, or, if crossed, to the lawful indorser.

Digitized by Google

The following return gives the number and value of Postal Notes issued from the Year 1894 to 1902 inclusive :—

Postal Notes Issued, 1894 *to* 1902.

Value of Note:	1s.	1s. 6d.	2s. 6d.	5s.	7s. 6d.	10s.	Total.	Value received.	Commission received.
Fee charged.	½d.	½d.	1d.	2d.	3d.	3d.			
Year.								£	£
1894 ..	783	611	522	929	333	1,157	4,335	1,086	30
1895 ..	862	812	580	1,213	376	1,347	5,190	1,294	36
1896 ..	1,212	977	833	1,441	432	2,139	7,034	1,830	56
1897 ..	2,237	1,929	1,825	3,167	1,098	4,053	14,309	3,715	99
1898 ..	3,737	2,864	2,466	5,661	1,713	7,056	23,497	6,296	180
1899 ..	6,250	5,134	6,031	12,340	4,728	12,764	47,247	12,691	370
1900 ..	7,872	6,544	6,452	13,952	4,567	19,793	59,180	16,788	473
1901 ..	10,109	8,061	7,032	15,941	5,671	25,802	72,616	21,002	598
1902 ..	8,119	5,394	7,447	18,014	6,240	26,533	*122,877	55,841	1,063

* Including 4,012 of 2s.; 4,474 of 3s.; 2,575 of 3s. 6d.; 4,224 of 4s.; 2,203 of 4s. 6d.; 2,084 of 10s 6d.; 6,105 of 15s., and 25,453 of 20s.

Unclaimed Letters.

The following table shows the number of Unclaimed Letters of every description dealt with during the years 1899, 1900, 1901, and 1902 :—

	1899.	1900.	1901.	1902.
Ordinary Letters, Inland ..	80,913	81,193	87,151	77,627
Registered Letters, Inland ..	2,850	3,059	2,814	2,615
Ordinary Letters returned to other countries	48,176	26,749	24,255	27,714
Registered letters returned to other countries	604	577	554	551
Letters, Newspapers, etc., destroyed	62,392	103,103	126,408	114,952
Total	194,935	214,681	241,182	223,459

Money orders, cheques, bank drafts, bank notes, postage stamps, and coin to the value of £2,878 were returned to the senders in 1899.

During 1900 the money orders, cheques, coin, postal notes, bank notes, bank drafts, postage stamps, and promissory notes so dealt with amounted in value to £3,499.

In 1901, money orders, cheques, coin, postal notes, bank notes, bank drafts, postage stamps, and promissory notes, to the value of £3,740, were similarly dealt with.

The value of money orders, cheques, coin, etc., returned to senders *during 1902, was £2,991.*

Digitized by Google

In addition to the above, gold, silver, and metal watches, jewellery, etc., of an unknown value, were also returned.

Parcel Post.

Parcels may be accepted for transmission to every country from and to all parcel post offices in the State which are served by railway, coach, or steamboat.

On March 10th, 1903, an Inland Parcel Post between the principal Western Australian Post Offices was inaugurated, the conditions as to weight and size being the same as those of the International and Interstate Parcel Post.

Parcels must be limited in weight to 11lbs., and in size must not exceed three feet six inches in length, or six feet in girth and length combined.

Value Payable Parcel Post.—Facilities are also afforded for the transmission of small articles of merchandise, etc. The Value Payable Parcel Post is a system under which the Postal Department undertakes to deliver registered articles sent by Parcel Post within the Commonwealth, to recover from the addressee, on delivery, a specified sum of money fixed by the sender, and to remit this sum to the sender by money order, for which the usual commission is charged. This system is designed to meet the requirements of persons who wish to pay at the time of their receipt for articles sent to them, and also to meet the requirements of traders and others who do not wish their articles to be delivered except on payment. The conditions as to weight and size are the same as those of the ordinary parcel post.

Insurance.—Parcels to the United Kingdom and certain foreign countries may be insured to secure compensation in sums not exceeding £50.

The importance of the business transacted by the Parcel Post during the years 1895-1902 may be gauged from the following tables :—

Interstate Parcels.

	Received.	Despatched.	Total.
1895	7,998	1,250	9,248
1896	13,835	3,000	16,835
1897	18,017	4,961	22,978
1898	16,685	5,713	22,398
1899	15,533	5,460	20,993
1900	16,715	7,745	24,460
1901	16,809	5,419	22,228
1902	18,523	5,861	24,384

Digitized by Google

United Kingdom and Foreign Parcels.

	Received.	Despatched.	Total.
1895	4,125	806	4,931
1896	5,761	1,348	7,109
1897	7,045	2,818	9,863
1898	7,550	2,208	9,758
1899	8,454	2,348	10,802
1900	9,474	2,629	12,103
1901	10,057	2,362	12,419
1902	9,250	2,734	11,984

Postage Stamps and Post Cards.

The Revenue derived from the sale of Postage Stamps, Post Cards, etc.. in the past six years, has been as follows :—

Year.	Postage Stamps.	Post Cards.	Parcels Postage.	Postage on Official Correspondence. etc.
	£	£	£	£
1897	84,348	991	1,158	9,635
1898	83,633	958	731	7,699
1899	79,765	994	887	8,353
1900	85,289	1,148	759	9,531
1901	85,506	1,324	959	9,572
1902	133,935	1,365	1,005	8,874

Money Orders.

There were, at the end of 1902, 97 Money Order Offices established in Western Australia.

Number and amount of Money Orders (including Telegraphic Orders) Issued and Paid during the Years 1894 *to* 1902.

Year.		Issued.				Paid.			
		Number.		Amount.		Number.		Amount.	
1894	Inland ..	9,448	36,237	27,063	132,533	9,460	15,342	27,289	64,257
	Foreign ..	26,789		105,470		5,882		36,968	
1895	Inland ..	15,512	71,782	47,382	281,572	15,419	24,255	46,773	97,358
	Foreign ..	56,270		234,190		8,836		50,585	
1896	Inland ..	30,497	195,633	116,876	849,481	30,004	41,839	108,001	178,231
	Foreign ..	165,136		732,605		11,775		70,230	
1897	Inland ..	46,506	252,158	173,078	1,059,529	45,994	60,428	174,954	247,391
	Foreign ..	205,652		886,451		14,434		72,437	
1898	Inland ..	67,439	231,387	253,996	888,389	67,404	80,784	253,558	330,597
	Foreign ..	163,948		634,393		13,380		77,039	
1899	Inland ..	65,980	173,532	242,133	655,812	66,099	86,438	241,924	312,239
	Foreign ..	107,552		413,679		20,339		70,315	
1900	Inland ..	69,277	183,667	270,900	702,873	68,410	86,298	271,864	336,557
	Foreign ..	114,390		431,973		17,888		64,693	
1901	Inland ..	69,810	192,477	275,952	725,584	66,512	82,080	273,977	338,623
	Foreign ..	122,667		449,632		15,568		64,646	
1902	Inland ..	71,965	189,514	301,957	768,751	69,903	85,700	299,593	372,089
	Foreign ..	117,549		466,794		15,797		73,496	

Commission received on Money Orders during 1899, was £10,242; 1900, £9,281, 1901, £8,843, and 1902, £9,683.

Digitized by Google

It can be seen by the foregoing table that the number of Money Orders issued increased from 36,237 in 1894 to 192,477 in 1901. the number in 1902, finally, again falling to 189,514.

In 1894 orders were issued—payable within the State and abroad —for £132,533, which amount increased rapidly during the next three years up to 1897, when it reached the enormous total of £1,059,529. In 1901 the "orders" amounted to £725,584, being issued as follows:— £275,952 payable within the State; £202,369 payable in Victoria; £73,043 payable in New South Wales; £60,618 payable in South Australia; £37,209 payable in other Australasian States; £43,387 payable in the United Kingdom; £7,845 payable in other British Possessions, and £25,161 in Foreign Countries; making, in all, a total of £725,584 issued by Money Order Post Offices in Western Australia during the twelve months, £449,632 of which was payable abroad. The "orders" issued during 1902 were payable in the following countries: £301,957 in Western Australia; £221,695 in Victoria; £72,395 in New South Wales; £67,739 in South Australia; £24,276 in other Australasian States; £39,612 in the United Kingdom; £8,051 in other British Possessions, and £33,026 in Foreign Countries.

It will be seen that during the years 1898-1902 the amounts did not fluctuate very considerably, the only really great difference being in the amounts of Foreign orders issued, which fell from £634,393 in 1898 to £413,679 in 1899, and rose again slightly during the next three years.

The number of "Orders" drawn by Foreign offices and made payable in Western Australia increased from 5,882 in 1894 to 15,797 in 1902. During 1894, £36,968 was paid out by the Post Office Department of Western Australia on Foreign "Orders"; from that period there was a yearly increase up to the 31st December, 1898; the amount paid that year was £77,039; since then the amount decreased somewhat, being £64,646 in 1901; but in 1902 it rose once more, to £73,096.

6.—TELEGRAPHS.

The first telegraph line constructed in Western Australia was that between Perth and Fremantle—a distance of exactly twelve miles—which was constructed by a private company, and opened for traffic on the 21st June, 1869. This line was taken over by the Government during April, 1871.

The line from Perth to York was finished and opened for traffic on the 6th of January, 1872. The line to Albany commenced business

Digitized by Google

on the 26th of December the same year. The line to Geraldton was completed on the 13th of May, 1874. The Eucla (Interstate) line, connecting Western Australia with the other Australian States, was finished on the 8th of December, 1877, and at the end of that year the Government owned 1,515 miles of telegraph lines. The discovery of the gold mines at Yilgarn necessitated the construction of the line to Southern Cross, which was opened for business in February, 1892. The Wyndham line, which is 2,125 miles in length and 3,131 miles distant from Eucla, was opened in January, 1893. During the same year, also, the lines to Karridale and Broomehill were constructed.

During the year 1894, the line from Southern Cross was extended to Kalgoorlie, the Geraldton line to Cue and Nannine was opened, and Marble Bar was connected with Condon. At the close of the year 1894 there were, altogether, 4,403½ miles of telegraph lines under control of the Telegraph Department.

During the year 1895, 174 miles of poles and 660 miles of wire were erected, 486 miles of the latter being duplications of existing lines. Up to the close of 1895, 4,577 miles of telegraph lines had been constructed, the cost of which was £269,308. At that time the construction of telegraphs and telephones was transferred from the Public Works Department to the Postal Department, and the expenses have since been defrayed from the Consolidated Revenue.

During 1896, 853 miles of poles and 1,278 miles of wire were erected, principally on the goldfields, the most important work of the year being the construction of the line from Coolgardie to Eucla, *via* Dundas, a distance of 550 miles; extra wire, 130 miles in length, was also placed on the Perth to Northam line.

In 1897, 541½ miles of poles and 1,288½ miles of wire were erected; two copper wires (340 miles) were placed on the Northam-Southern Cross line, one copper wire (73 miles) on the Mullewa-Yalgoo route, two copper wires (24 miles) on the Perth-Fremantle line, and one each on the suburban lines to Subiaco and Leederville (three miles); making a total of 440 miles of copper wire for the year. New lines; with iron wire, from Niagara to Lawlers, including Mt. Margaret and Mt. Leonora branch, 210 miles; Marble Bar to Nullagine, 61 miles; Pilbara to Western Shaw, 75 miles; Minginew-Mullewa, including loop from main line, 47 miles of poles and 118 miles of wire; and Yalgoo to Gullewa, 46 miles, were constructed during the twelve months.

During 1898, 101 miles of poles and 562 miles of wire were erected: 230 miles of copper wire were placed on the Coolgardie line, 52 miles on Yalgoo-Cue line, 63 miles on the Perth-Helena Vale line, 40 miles on the Geraldton-Walkaway line, and 12 miles on the Perth-Suburban lines, making a total of 397 miles of copper wire which had been placed on existing lines during the year. Apart from this, the most important work of the year was the construction of the line from

Digitized by Google

Nannine to Peak Hill, with 103½ miles of iron wire. Total mileage, 31st December, 1898, 5,886 miles of poles and 8,650 miles of wire.

During 1899, a further 54¾ miles of poles and 168½ miles of wire were added, the iron wires between Coolgardie and Kalgoorlie being replaced by copper wires, whilst Mount Margaret was connected with Laverton, etc., etc. The additions in 1900 were 111¼ miles of poles and 123¼ miles of wire, the principal connection being the line between Lawlers and Wiluna, which consisted of 107¼ miles of iron wire. During 1901, 120¾ miles of poles and 232¼ miles of wire were erected. The principal lines undertaken were those to Ravensthorpe and Mulline, and the duplication to Mount Malcolm. The total mileage on the 31st December, 1901, was 6,111¾ miles of poles and 9,104½ miles of wire. No additional lines were constructed during 1902.

The principal expenditure on telegraph construction until the year 1896 was from Loan Funds; since the time the construction of the telegraph lines was taken over by the Post and Telegraph Department, the cost has been mostly defrayed from Consolidated Revenue.

Details of the expenditure on construction, from the 30th June, 1896, are as follows:—

Year ended 30th June.	From Loans.	From Revenue.	Total.
	£	£	£
1896	10,952	13,791	24,743
1897	..	53,245	53,245
1898	..	11,045	11,045
1899	6,135 *a*	..	6,135
1900	5,719 *a*	843	6,562
1901	17,019 *a*	*Nil.*	17,019
1902	*Nil.*	..	*Nil.*
Totals ..	39,825	78,924	118,749

a Classified as Development of Goldfields.

Cable communication is available from Western Australia to Europe, either direct by Roebuck Bay or *via* Adelaide and Port Darwin, or *via* South Africa. Roebuck Bay, 2,491 miles from Eucla, is the station where the alternative cable of the Eastern Extension Telegraph Cable Company from Banjowangie is landed.

The distance to London, *via* Roebuck Bay is—

Perth to Roebuck Bay	1,485	miles
Roebuck Bay to Banjowangie	970	"
Banjowangie to London	9,841	"
Total	12,896	"

Digitized by Google

Via Port Darwin—

Perth to Eucla	1,006	miles
Eucla to Adelaide	1,000	„
Adelaide to Port Darwin	2,134	„
Port Darwin to Banjowangie	1,150	„
Banjowangie to London	9,841	„
Total	15,131	„

And *via* South Africa—

Perth to Cocos Island	1,777	miles
Cocos Island to Rodriguez	2,235	„
Rodriguez to Mauritius	405	„
Mauritius to Durban	1,786	„
Durban to Cape Town .. .. (about)	800	„
Cape Town to St. Helena	1,891	„
St. Helena to Ascension	820	„
Ascension to St. Vincent	1,828	„
St. Vincent to Madeira	1,176	„
Madeira to Penzance	1,341	„
Penzance to London .. .. (about)	260	„
Total	14,319	„

Number of telegrams transmitted, and Revenue therefrom, during the years 1901 *and* 1902.

—	1901.		Total.	Value.		
	Outward.	Inward.		£	s.	d.
Local Traffic	..	..	912,335	55,201	2	9½
Interstate	153,379	129,617	282,996	19,333	13	3
Cables, West Australian	15,903	12,007	27,910	7,279	9	2
„ for other States	1,121	1,237	2,358	404	6	5½
South Australian Cable Guarantee ..	..	..	..	1,000	0	0
Registration Fees, etc.	..	..	..	327	9	2
Totals	..	..	1,225,599	83,546	0	10

—	1902.		Total.	Value.		
	Outward.	Inward.		£	s.	d.
Local Traffic	..	..	878,469	48,153	11	6½
Interstate Traffic	165,254	141,025	306,279	17,436	2	5
Cablegrams, West Australian ..	15,916	11,703	27,619	6,740	19	4½
„ for other States ..	1,308	1,386	2,694	461	7	6
Registration Fees, etc.	..	..	..	250	12	0
Totals	..	..	1,215,061	73,042	12	10½

Digitized by Google

Electric Telegraphs, 1893 to 1902.

Year.	Number of Stations.	No. of miles of poles.	No. of miles of wire.	No. of messages paid and unpaid.			Receipts.
				Between Stations.	Foreign and Interstate.	Total.	
							£
1893 ..	60	3,678	4,303	214,454	69,138	283,592	16,388
1894 ..	73	4,403	4,939	300,936	145,844	446,780	25,936
1895 ..	88	4,577	5,670	462,756	258,236	726,992	61,673
1896 ..	111	5,429¾	6,948	776,097	402,309	1,178,406	99,088
1897 ..	142	5,845	8,111	869,269	436,734	1,306,003	98,696
1898 ..	147	5,886	8,660	839,290	339,638	1,178,928	77,801
1899 ..	154	5,941¼	8,749	803,507	333,006	1,136,513	81,365
1900 ..	161	6,052½	8,872¾	859,942	307,255	1,167,197	75,014
1901 ..	167	6,111¾	9,104½	912,335	313,264	1,225,599	82,533
1902 ..	167	6,111¾	9,104½	878,469	336,592	1,215,061	44,144

From the above table it will be observed that during the last ten years there has been a great development of the telegraph system of the State, with a consequently corresponding increase in the business transacted over the various lines, which now connect with almost all the towns and mining centres in Western Australia. The number of stations increased during the decade from 60 to 167; the miles of poles from 3,678 to 6,111¾; the miles of wire from 4,303 to 9,104½; the number of messages received and transmitted from 283,592 to 1,306,003 during 1897, after which they decreased slightly to 1,225,599 during 1901, and to 1,215,061 in 1902. From 1893, following up the extension of the lines to the Eastern goldfields, the business of the department for the years 1894, 1895, and 1896 progressed at a rapid rate, the receipts being respectively £25,936, £61,673, and £99,088. After a slight fall to £98,696 in the following year, they suddenly, in 1898, owing to the slump in the share market, fell to £77,801, and then fluctuated to £82,533 in 1901. In 1902 the system of attaching postage stamps to telegrams was introduced. The effect of which was, of course, an apparent falling off in the receipts for telegrams, and a corresponding increase in the revenue derived from stamps.

Digitized by Google

7.—TELEPHONES.

The telephone exchange system was opened in Perth on the 1st December, 1887, and at Fremantle 1st January, 1888.

Telephone Bureaux.

Telephone bureaux are established at the following telegraph offices :—

METROPOLITAN AREA.

General Post Office	Open continuously throughout the year.
Perth Railway Station Fremantle Post Office Fremantle Railway Station Fremantle Town Hall Claremont Post Office Cottesloe Post Office Subiaco Post Office Midland Junction Post Office	Open 7 a.m. to 6 p.m. (Sundays excepted).
Leederville Post Office	Open 9 a.m. to 6 p.m. (Sundays excepted).

GOLDFIELDS AREA.

Boulder Post Office Coolgardie Post Office Kalgoorlie Post Office	Open 7 a.m. to 6 p.m. (Sundays excepted).

The fee for local calls is uniformly 3d. (trunk calls, 6d.) for a conversation of three minutes, or part of three minutes, whether the call be made by subscribers or non-subscribers; and the period for which a line may be used by any one person does not exceed six (6) minutes in cases where other persons are waiting to use the line. Should the line be engaged, applicants are registered and connected n the order of priority.

Telephone Exchanges.

Name of Exchange.	Ordinary Hours of Attendance.	Remarks.
Perth	Open all day and night	On Christmas Day closed from 6 p.m. till 11 p.m.
Fremantle ..	Do. do.	
Coolgardie ..	Do. do.	
Cottesloe ..	Do. do.	
Kalgoorlie ..	Do. do.	
Boulder	Do. do.	
Albany	Do. do.	
North Fremantle	Open 8 a.m. till 11 p.m.	On Sundays and holidays open from 9 a.m. till 11 p.m., and on Good Friday and Christmas Day from 9 a.m. till 7 p.m.
Guildford ..	Do. do.	
Geraldton ..	Do. do.	
South Perth ..	Do. do.	
Northam ..	Do. do.	

Digitized by Google

Telephone Returns for the Years 1893 *to* 1902.

Year.	Number of Subscribers.		Total.	Mileage of Wire.	Annual Revenue.
	Subscribers.	Government Departments.			
					£
1893	157	77	234	329	1,967
1894	225	94	319	387	2,533
1895	373	121	494	462	3,853
1896	749	193	942	577	6,264
1897	1,345	244	1,589	1,527	11,886
1898	1,586	329	1,915	2,099	18,490
1899	1,797	318	2,115	2,102	20,705
1900	2,042	403	2,445	4,006	23,510
1901	2,335	429	2,764	4,944	26,950
1902	2,536	405	2,941	4,947	29,464

From the foregoing table it will be seen that the Telephone System of the State has made great progress in the last decade. At the close of the year 1893 there were 234 subscribers—including Government Departments—using 329 miles of wire, while the total revenue for that year was only £1,967. On the 31st December, 1901, the subscribers numbered 2,764, the mileage of wire had increased to 4,944 miles, and the receipts for the twelve months were £26,950, whilst in 1902 the corresponding figures were: 2,941 subscribers, 4,947 miles of wire, and receipts to the amount of £29,464.

Railway Telephone Lines.

	miles.
Government Railways	7,097
Midland Railway	277
Karridale Railway	40
Denmark Railway	44
Jarrahdale Railway	33
Waroona Railway	25
Yarloop Railway	13
Mornington Railway	7
Collie Mills Railway	5
Total	7,541

Grand Total Telephone Lines.

	miles.
Telephone Exchange	4,947
Railway	7,541
Total	12,488

Digitized by Google

PART III.—LAND.

1.—CROWN LANDS.

(Supplied by R. C. Clifton, Under Secretary for Lands.)

Land Settlement.

The Land Act of 1898 came into force on the 1st January, 1899. Under this Act the boundaries of the South-West and Eucla Divisions have been altered, the alterations increasing the former from 67,000 to 77,850 square miles, and diminishing the latter from 59,000 to 48,150 square miles. The Division formerly known as the Gascoyne is now called the Western Division. The names and boundaries of the other Divisions are unchanged.

Land Divisions.

For the purposes of the Act, the State is divided into six Divisions:—

The South-West Division.
" Western "
" North-West "
" Kimberley "
" Eucla "
" Eastern "

South-West Division.

This Division contains 77,850 square miles, and comprises, as regards climate, the most temperate part of Western Australia. It is the portion of the State that was first settled.

Its South-Western corner, which is heavily timbered and well watered, is capable of supporting a large population. It is generally an undulating country.

Numerous rivers enter the sea within this Division, but they are all very short, and merely drain the country within 100 miles of the coast.

In the natural state of the land in these parts about 10 acres are required to keep a sheep, but with clearing and improving the same land will keep a sheep to two acres, and in choice places a sheep to one acre.

Most of the European grains, fruits, and vegetables can be cultivated and brought to a high state of perfection in the South-West Division. The soil in parts is sandy, but this sand, when

Digitized by Google

irrigated, is highly productive. There is also a large extent of light, friable soil suitable for all kinds of crops.

The climate is very good, and the rainfall varies from 10 inches in the Northern and Eastern, to 43 inches in the South-Western and Southern portions of the Division.

The average temperature in the North is about 66°, to the Eastward 63°, on the West Coast 63°, and on the South Coast 59°.

The average temperature for the Division, taken as a whole, is about 63°, while the average rainfall amounts to about 26 inches.

Western Division.

This Division contains an area of 133,000 square miles.

The country is, in its present state, only suitable for pastoral purposes, and has been proved to be healthy for all kinds of stock. It is fairly well watered, and capable of much improvement by fencing the land and conserving water or sinking for it. It is generally a very flat country.

Included in the Western Division are the Murchison, Peak Hill, Yalgoo, and Ashburton Goldfields.

The climate is good, though the heat is great in the summer.

The average temperature is about 72°, while the average rainfall is about 8 inches.

The Murchison and Gascoyne Rivers, and their tributaries, drain this important Division.

North-West Division.

This Division contains 81,000 square miles. It is a rich pastoral country, consisting of well grassed plains intersected by bold ranges and hills covered with spinifex (*triodia irritans*) in most cases. It is capable, in the best portions, when fenced in, of carrying a sheep to two acres.

It is fairly well watered, and stock thrive and increase satisfactorily.

The climate is healthy, but the heat in summer is great.

Average temperature, about 76°; average rainfall, about 10 inches.

The Pilbara Goldfield is within this Division.

Kimberley Division.

This Division contains an area of 144,000 square miles.

The principal rivers are the Fitzroy, emptying into King Sound; the King Edward and Drysdale, emptying into Napier Broome Bay; and the Ord, emptying into Cambridge Gulf.

Digitized by Google

The Kimberley Goldfields, situated at the watershed of the Fitzroy and the Ord, at one time attracted considerable notice. Owing, however, to their distance from either of the two Ports, Wyndham and Derby, and the great expense of transport and provisions, also the want of suitable labour, they have not thus far had a fair chance of development.

A telegraph line connects Derby, Wyndham, and the goldfields with Perth, and the Eastern Extension Telegraph Company's alternative cable lands at Roebuck Bay.

There is magnificent country in this portion of the State for both sheep and cattle, which, especially the latter, thrive remarkably well; and in the future it is likely to be the great source of the meat supply for export and home consumption.

The climate is fairly good, though trying on account of the heat. The land on the alluvial plains is very rich, and, with irrigation, suitable for tropical culture.

Average temperature, about 83°; average rainfall, about 25 inches.

Eucla Division.

This Division contains 48,150 square miles, and is almost unoccupied. The portion Eastward of Point Culver is very badly watered. With the exception of a few places along the coast, it is almost destitute of permanent water.

The country between the Fitzgerald River and Point Culver is fairly watered and moderately grassed.

The country North of Eucla is an elevated plateau, splendidly grassed and well suited for stock if permanent water be obtained.

With the exception of a small fringe along the coast, the Division is unoccupied.

Average temperature, about 61°; average rainfall, about 16 inches.

Eastern Division.

This immense Division contains 491,920 square miles, and comprises the interior of Western Australia.

The Yilgarn, Coolgardie, East Coolgardie, Dundas, East Murchison, Mount Margaret, and other goldfields of the Eastern Goldfields Group, which lie within the Division, are amply fulfilling the hopes originally entertained as to their permanency and richness.

Average temperature, about 63°; rainfall, about 8 inches.

Google

Land Districts.

In addition to the Land Divisions, which have been principally arranged with reference to the Land Regulations dealing with Pastoral Leases, the State is also divided into Land Districts, mainly for the purpose of conveniently dealing with Land Sales. There is no definite connection between the two modes of dividing the State; but, to facilitate research, after each District in the following list the name or names have been printed of the Division or Divisions in which the District is to be found.

Ashburton (N.W.)
Avon (S.W. and Eastern)

Balladonia (Eucla and Eastern)
Bulga (Eastern)
Buningonia (Eastern)

Canning (S.W.)
Cockburn Sound (S.W.)

Dampier (Kim.)
De Grey (N.W. and Eastern)
Dampier (Eastern)
De Witt (N.W.)
Dundas (Eastern)

Edel (W.)
Edjudina (Eastern)
Erivilla (Western and Eastern)
Esperance (S.W.)

Fitzgerald (Eastern)
Fitzroy (Kim.)
Forrest (N.W. and Eastern)
Fraser (Eastern)

Gascoyne (W.)
Gregory (N.W.)

Hampton (Eastern)
Hardey (N.W. and W.)
Hay (S.W.)

Jaurdi (Eastern)
Jilbadji (Eastern)

Kaluwiri (Eastern)
Kent (S.W.)
King (Kim.)
Kojonup (S.W.)
Kyarra (Eastern and Western)

Leake (Eastern)
Lyndon (N.W. and W.)
Lyons (W.)

Malcolm (Eastern)
Mardarbilla (S.W. and Eucla)
Marmion (Eastern)
Meda (Kim.)
Melbourne (S.W. and Eastern)
Mundrabilla (Eucla)
Murchison (W.)
Murray (S.W.)

Nabbern (Eastern)
Nelson (S.W.)
Neridup (S.W.)
Ngalbain (Eastern)
Ningham (Eastern)
Nookawarra (W.)
Nuleri (Eastern)
Nurina (Eucla)
Nuyts (Eastern and Eucla)

Oldfield (S.W.)

Pardu (N.W., Kim., and Eastern)
Peawah (N.W.)
Plantagenet (S.W.)

Roe (S.W. and Eastern)

Sussex (S.W.)
Swan (S.W.)

Teano (W. and Eastern)
Thaduna (Eastern)

Victoria (S.W., W., and Eastern)

Ularring (Eastern)

Warramboo (W.)
Weld (Eastern)
Wellington (S.W.)
Williams (S.W.)
Windell (N.W., W., and Eastern)

Yelina (Eastern)
Yilgarn (Eastern)

Digitized by Google

Explanatory Notes respecting Land Selection under the Land Act of 1898.

PURCHASE BY AUCTION—TOWN AND SUBURBAN LANDS.

(SECTIONS 47 TO 52.)

Town and Suburban Lands throughout the State, after being surveyed into lots and notified in the *Government Gazette* as open for sale, shall be sold by public auction, at upset prices to be determined by the Governor; 10 per cent. of the purchase money shall be paid upon the fall of the hammer (unless the purchaser has already paid a deposit of 10 per cent. on his application), and the balance by four equal quarterly instalments, subject to alteration by regulations, from the first day of the next quarter following the date of sale; the Crown Grant and registration fees being payable with last instalment. All suburban land is sold subject to the conditions that each lot shall, within two years from the date of sale, be fenced on the surveyed boundaries with a fence of the prescribed description; but the Minister may accept other improvements in lieu of the fencing, and in default thereof the land shall be forfeited, together with all purchase money and fees which may have been paid.

On payment by the purchaser of town or suburban lands of the first prescribed instalment of the purchase money, a license may be issued entitling the holder to occupy the land, and such license may be mortgaged or transferred, as prescribed by the Act.

Suburban lands set apart for cultivation are sold by auction; 10 per cent. of the purchase money being paid on the fall of the hammer, and the balance within five years, by equal half-yearly instalments, on the 1st March and 1st September in each year, the Crown Grant fees being payable with the last instalment. The land must be substantially fenced on the surveyed boundaries, within two years from the date of sale, and one-tenth of the area must be planted with vines or fruit trees, or cultivated *bona fide* as a vegetable garden, or otherwise one-fourth of the land must be cleared and cultivated.

CONDITIONAL PURCHASE BY DEFERRED PAYMENT, WITH RESIDENCE, UNDER SECTION 55.

This Section is applicable to land within an Agricultural Area, and also to any other land in the South-West Division, or within the Eastern and Eucla Divisions, which may from time to time be declared open for selection.

The ordinary price of land under this Section is 10s. per acre (but this price may be increased in special cases), payable half-yearly at the rate of 6d. per acre per annum, and subject to the prescribed fines for late payment. The maximum area held by one person shall be 1,000 acres, and the minimum, except in special cases, 100 acres: Provided that the area of any land held by the selector under

Digitized by Google

45, 47, or 48 of the Land Regulations of 1887, or under Sections 23 or 24 of "The Homestead Act, 1893," shall, in calculating the total area held by the lessee, be deemed to form portion of the maximum allowed.

Applications must be accompanied by a deposit of a half or a quarter year's rent, as the case may be: that is to say, if the application is made during the first quarter of the half year, a half year's rent is required; if in the second quarter, a quarter year's rent. In the event of the application not being approved, the deposit shall be refunded. On approval of the application by the Minister, a lease shall be issued for twenty years, to date from the first day of the quarter next preceding the date of the approval.

The lessee shall, within six months from the date of his lease, take personal possession of the land, and shall reside upon it and make it his usual home, without any other habitual residence, during at least six months in each year for the first five years from the date of the commencement of the lease; and if possession be not taken the land shall be forfeited: Provided that if the lessee is already the owner of rural land in freehold or under Special Occupation or Conditional Purchase, or is the holder of a lease of any such lands from the owner, or is the holder of a Homestead Farm within 20 miles of the land applied for, residence, as aforesaid, on such Freehold, Special Occupation License, conditional Purchase, or Homestead Farm shall be deemed sufficient residence under this section.

The lessee shall, within two years from the date of the commencement of his lease, fence at least one-tenth of the land contained therein, and within five years from said date shall fence in the whole of the land, and within ten years shall expend upon it in prescribed improvements, in addition to the exterior fencing, an amount equal to the full purchase money. The Minister may allow half the cost of the exterior fencing to count as part of the improvements. If the fence is rabbit-proof, and great and small stock proof, two-thirds of its value may be allowed towards the improvements.

At the expiration of the lease, or at any time after five years from the date of the commencement of the lease, provided all the conditions of fencing, residence, and improvements have been complied with, and the said fencing and improvements maintained, and also that the full purchase money and fees have been paid, a Crown Grant of the land shall issue on application.

Any person having obtained land of less extent than 1,000 acres may make other applications for land within 20 miles of the block first applied for, but his holdings under this Section must not exceed 1,000 acres. Residence on the additional leases is not required, but all the other conditions shall apply; provided that if two or more leases held by one person adjoin, they may be considered as one block

Digitized by Google

with respect to fencing and improvements; if not surveyed, the conditions shall date from the date of the survey instead of from the commencement of the lease.

Conditional Purchase by Deferred Payment without Residence.

(Section 56.)

Land within an agricultural area, and also any other land in the South-West Division, or within the Eastern and Eucla Divisions, which may from time to time be declared open for selection, may be applied for by persons who do not wish to reside upon their land, but subject to all the conditions (with the exception of residence) set forth in the preceding paragraph. Double the expenditure is, however, required in lieu of residence.

Conditional Purchase by Direct Payment.

(Section 57.)

The price of land under this Section is not less than 10s. an acre, payable within twelve months. The maximum area that may be selected by one person is 1,000 acres, and the minimum area is 10 acres.

Applications must be accompanied by 10 per cent. of the purchase money, and, on approval of the application by the Minister, a license shall be issued for seven years, dating from the first day of the quarter next preceding the date of approval of application. The balance of the purchase money shall be paid within twelve months from the date of the commencement of the license, by four equal quarterly instalments—on the 1st days of January, April, July, and October respectively—the first of such instalments to be paid on the first day of the quarter next following the commencement of the license. The licensee shall, within three years from the date of the commencement of the license, fence in the whole of the land, and within seven years from such date shall expend upon the land in prescribed improvements, in addition to the exterior fencing, an amount equal to 5s. per acre; and no Crown Grant shall issue until the Minister is satisfied that the prescribed conditions have been fulfilled. At the expiration of the license, or at any time during continuance of the license, provided that all the conditions of fencing and improvements have been complied with, and the said fencing and improvements maintained, and the full purchase money and fees have been paid, a Crown Grant of the land shall issue. It is further provided that if the area purchased under this Section is the balance of a surveyed block a portion of which has been granted to the applicant as a Homestead Farm, the Crown Grant for such area shall not issue until all the conditions appertaining to such Homestead Farm have been fulfilled.

Digitized by Google

Conditional Purchase of Small Blocks for Gardens, Vineyards, and Orchards.

(Section 60.)

Land may be obtained in small blocks for Gardens, Vineyards, Orchards, etc., on the following terms:—The price of the land shall be not less than £1 per acre; the maximum area allowed is 50 acres, and the minimum five acres, and two or more applications may be made to obtain the maximum. A deposit of 10 per cent. of the purchase money is required upon application, and the balance shall be paid within three years from the date of the approval of the application, by equal half-yearly payments, on the 1st of March and September. The improvements required are that the land shall be fenced within three years, and that one-tenth of the same shall, within the same period, be planted with vines or fruit trees, or cultivated *bona fide* as a vegetable graden.

Conditional Purchase Grazing Lands, Second and Third-class Lands.

(Section 68.)

Leases for thirty years of second and third-class lands are granted, t[illegible]led Grazing Leases, but which are really another form of Con-O[illegible]ional Purchase. The price of second-class land is not less than [illegible] 3d. per acre, and of third-class land 3s. 9d. per acre, payable half-yearly at the rate of 2½d. and 1½d. per annum respectively. If two or more adjoin they may be fenced as one lease. The maximum area is 3,000 acres of second-class, and 5,000 acres of third-class land, and the minimum in both cases is 1,000 acres, except when adjoining the holding of the applicant, when the minimum is 300 acres; and if one person selects leases in different classes, the total quantity of same must not exceed 4,000 acres, the minimum being the same as before, except in special cases. The conditions are as follows:—The lessee shall pay one-half the cost of survey in 10 half-yearly instalments, the first of such instalments being paid with his application, and subsequent instalments on the 1st day of March and 1st of September in each year. Within six months from the date of commencement of his lease, the lessee must take possession of the land, and reside upon it during at least six months of the first year, and nine months in each year for the next four years. Residence may, however, be complied with by the lessee's agent or servant. Within two years from date of the commencement of his lease, the lessee shall fence at least one-tenth of the area contained therein, and within five years from the same date shall fence in the whole of the land, and within 15 years of the said date shall expend upon the land, in prescribed improvements in addition to the exterior fencing, an amount equal to the full purchase money.

The following shall be deemed improvements:—Subdivision, clearing, grubbing, draining, ringbarking, tanks, dam[illegible] and

Digitized by Google

any other work upon the land which increases or improves its agricultural or pastoral capabilities: Provided that where the lessee has erected a sheep and cattle-proof or rabbit-proof exterior fence, half its value may be allowed towards the improvements.

If the land is not surveyed, the conditions shall date from the date of survey. At the expiration of the lease, or at any time after five years from the date of the commencement of the lease, provided all the conditions of fencing, residence, and improvements have been complied with, and the said fencing and improvements maintained, and also that the full purchase money and fees have been paid, a Crown Grant of the land shall issue on application.

Conditional Purchase Poison Lands.

(Section 71.)

Land shall be considered as Poison Land when, in the opinion of the Minister, it is so infested with poisonous indigenous plants that sheep or cattle cannot be depastured thereon. The price is not less than 1s. per acre, payable half-yearly at the rate of one-thirtieth of the total purchase money per annum. The maximum area allowed is 10,000 acres, and the minimum, 300 acres. Upon approval of the application (which must be accompanied by a deposit of rent equal to the first instalment), a lease shall issue for 30 years dating from the first day of the quarter next preceding the date of application. Any person obtaining less than 10,000 acres may make other applications up to 10,000 acres, and if any two adjoin they may be fenced as one lease. The lessee shall pay the prescribed cost of survey in 10 half-yearly instalments, the first instalment being paid with his application.

The conditions are that the lessee shall, within two years from date of the commencement of his lease, fence at least one-tenth of the land comprised therein, and within five years from same date shall enclose the whole area with a fence of the prescribed description, and during the term of his lease shall eradicate the whole of the poisonous indigenous plants, as prescribed.

At the expiration of the lease, or at any time during the currency of the same, provided all the foregoing conditions have been complied with, the fencing properly maintained, and the full balance of the purchase money and fees have been paid, and provided that the land has been rendered safe for depasturing cattle and sheep at all seasons, and has continued so for a term of two years, a Crown Grant of the land shall issue.

Free Homestead Farms—160 Acres Free.

Every person who does not already own more than 100 of land within the State in freehold, or under Special O or Conditional Purchase, and being the head of a family, who has attained the age of 18 years, may apply for a

Digitized by Google

Farm of not more than 160 acres or less than 10 acres from lands declared open for such selection.

Every applicant shall make a Statutory Declaration and forward same to the Minister or his agent, accompanied by a fee of £1. Upon approval of the application, the applicant shall receive an Occupation Certificate authorising him to enter upon and take possession of his land for the term of seven years, to be computed from the first day of the quarter next preceding the date of approval of his application.

Within six months from the date of such Occupation Certificate, the selector shall take personal possession of the land, and reside upon it for at least six months in each year for the first five years of the term of his certificate. If possession be not so taken, the Occupation Certificate shall be cancelled and the land forfeited, together with all improvements. Residence on selections (under Section 55) adjoining will be deemed to comply with the residence required on the Homestead Farm.

In certain cases of illness, or for other valid reasons, the Minister may waive forfeiture for non-residence upon the land, or authorise absence. Within two years from the date of his Occupation Certificate a habitable house must be erected of not less than £30 in value, or the selector shall expend £30 in clearing, or clearing and cropping, or prepare and plant two acres of orchard or vineyard. Within five years from said date the selector shall fence in at least one-fourth, and shall clear and crop at least one-eighth.

Within seven years the whole must be fenced, and at least one-fourth cleared and cropped. At the expiration of seven years from date of his Occupation Certificate the selector shall, provided all the conditions have been duly performed, obtain a Crown Grant on payment of the usual fees; but, if the conditions have not been effected, the land shall be forfeited.

The Crown Grant may be obtained after twelve months' residence upon the selector proving to the Minister that the necessary conditions have been fulfilled, and on payment of 5s. per acre, together with the fees referred to in the preceding paragraph. Homestead Farms cannot be mortgaged, except to the Agricultural Bank; and can only be transferred to persons who are qualified to hold. The holder of a Homestead Farm may hold other conditional purchase land; and, where residence is a condition, residence on the Homestead Farm, if within 20 miles, will be sufficient.

Working Men's Blocks.

(Part IX.)

Every person who does not own land within the State in freehold, or under Special Occupation, or Conditional Purchase, or a Homestead Farm under "The Land Act, 1898," or "The Homesteads Act, 1893," who is the head of a family, or a male who has attained

Digitized by Google

the age of 18 years, shall be entitled to obtain a lease of lands *set apart for Working Men's Blocks*. The maximum area that may be selected by one person is, if within a goldfield, half an acre, or five acres elsewhere; and only one block may be selected by one person.

The price of land is not less than £1 per acre, payable half-yearly, at the rate of one-tenth of the total purchase money per annum, or sooner. Application shall be accompanied by a deposit of half a year's rent at the above rate. Upon approval, a lease shall issue for ten years, dating from the first day of the quarter next preceding the date of approval. The lessee shall, within three months from the date of lease, take personal possession of the land, and reside upon it during at least nine months in each of the first five years of the lease: Provided that possession may be taken by and residence performed by the lessee's wife or a member of his family. Within three years from the date of commencement of the lease the whole of the land must be fenced on the surveyed boundaries; and within five years from same date an amount equal to double the full purchase money, in addition to his house and exterior fencing, must be expended on the land in prescribed improvements.

At the expiration of the lease, or at any time after five years from commencement of the lease, provided that all the conditions of residence, fencing, and improvements have been complied with, and the said fencing and improvements maintained, and also that the full purchase money and fees have been paid, a Crown Grant of the land may issue.

In certain cases of illness, or for other valid reasons, absence may be allowed and forfeiture waived.

Definition of Fence.

Fence, wherever mentioned, means any substantial fence, not being a brush fence, proved to the satisfaction of the Minister to be sufficient to resist the trespass of great and small stock, including sheep, but not including pigs or goats.

Pastoral Lands.

(Part X.)

Leases of Pastoral Lands within the several Divisions are granted on the following terms:—In the South-West Division, in blocks of not less than 3,000 acres, at a rental of £1 per annum for each 1,000 acres, or part of 1,000 acres; if, however, the land is in that part of this Division situated Eastward of a line from the mouth of the Fitzgerald River in the direction of Mount Stirling, the rental shall be 10s. per 1,000 acres or part thereof. In the Western and North-West Divisions, in blocks of not less than 20,000 acres, at a rental of 10s. per annum per 1,000 acres

Digitized by Google

or part thereof. In the Eucla Division, in blocks of not less than 20,000 acres at a rental of 5s. per 1,000 acres or part thereof per annum. In the Eastern Division, in blocks of not less than 20,000 acres, at the following rental :—For each 1,000 or part of 1,000 acres, 2s. 6d. for each of the first seven years, and 5s. for each of the remaining years of the lease. In the Kimberley Division, in blocks of not less than 50,000 acres when on a frontage, nor less than 20,000 acres when no part of the boundary is on a frontage, at a rental of 10s. per annum for each 1,000 acres or part thereof.

In any case where land applied for is shut in by other holdings, and does not contain the minimum area fixed by these regulations, a lease for a lesser quantity may be granted.

A Pastoral Lease gives no right to the soil or to the timber except for fencing and other improvements on the lands leased; and the lands may be reserved, sold, or otherwise disposed of by the Crown during the term of the lease. Any Pastoral Lessee upon being deprived by the Minister of the use of any land held under Pastoral Lease shall, as prescribed by "The Land Act, 1898," receive fair value for all improvements on the land of which he has been deprived. In the event of the land being selected from his lease under Conditional Purchase, he is entitled to claim from the Conditional Purchaser fair value of any lawful improvements on the land applied for, or which, being outside such land, but comprised in such lease, have become valueless, or lessened in value, the value of the improvements to be ascertained by arbitration, as prescribed by Sub-section 1 of Section 148 of "The Land Act, 1898." All Pastoral Leases expire on the 31st December, 1928.

Reduction of Rent for Stocking.—Any lessee in the Kimberley Division, or in that part of the South-West Division situated to the Eastward of a line from the mouth of the Fitzgerald River in the direction of Mount Stirling, who at any time during the term of his lease shall have in his possession within the Division 10 head of sheep or one head of large stock for each 1,000 acres leased, shall, from the 1st of January, after he shall have satisfied the Minister to the above effect, have a reduction of rent for the remaining years of his lease of one-half of the rent due under this Act.

Penalty for Non-stocking.—A penalty of double rental for the remaining portion of the term of the lease is imposed, except in the South-West Division, if the lessee has not, within five years, complied with the conditions as to stocking.

Boundaries of Pastoral Leases may be amended on payment of a fee of £2.

Permission may be granted to ringbark, in the discretion of the Minister. on application.

Digitized by Google

Any Pastoral Lessee in the South-West Division, at any time during the continuance of his lease, may apply in the form prescribed by this Act for land within his lease, not being within an agricultural area, or land withdrawn from Conditional Purchase Selection, in one or more blocks, not exceeding three separate selections adjoining his homestead, and not exceeding twenty per cent. of the aggregate quantity held on lease by him from the Crown within such Division; and on approval of the application, a lease shall be granted subject to all the conditions appertaining to Conditional Purchases under Section 55 of this Act, except residence; provided that the maximum area shall be 3,000 acres, and the minimum, except in special cases approved by the Minister, shall be 200 acres. If the land so selected is within a properly fenced enclosure, the fencing of the land upon the boundaries shall not be obligatory: Provided always, that this Section shall not permit any Pastoral Lessee who, prior to the coming into operation of this Act, has taken advantage of a similar provision in the Land Regulations of 1887 to obtain, under this Section and such Regulations, a greater area than 3,000 acres.

Any Pastoral Lessee in the Kimberley, North-West, Western, Eastern, and Eucla Divisions who shall have in his possession in any such Division at least ten head of sheep or one head of large stock for each 1,000 acres leased, may apply to purchase, in any such Division, any Crown Land within his lease (not being within an agricultural area or a goldfield), in one or more blocks, not exceeding in the aggregate one per cent. of the total area held by such lessee under Pastoral Lease in such division, on the same terms and subject to the same conditions as are prescribed for purchase under Section 55, except the condition of residence: Provided that the minimum area in each block shall be 500 acres and the maximum 5,000 acres; and in no case shall more than three separate selections be allowed to be taken by one lessee.

Pastoral Leases within Goldfields and Mining Districts.

(Section 102.)

Any Crown Land within a goldfield or mining district, not required to be reserved for any public purpose, may be leased for pastoral purposes in blocks of not less than 2,000 acres, or more than 20,000 acres, at the same rental as that prescribed for leases in the Division in which the land is situated: Provided that if the land is so shut in by other holdings as not to contain 2,000 acres, the Minister may, in his discretion, grant a lease of such lesser quantity; but in no case shall a lease be issued for a less sum than £1 per annum.

The lessee shall not have the right to select land within such lease under the provisions of the 61st or 62nd Sections of this Act, and, in the event of the land or any portion of it being taken for an agricultural area, the lessee shall not be entitled to more than three

Digitized by Google

months' notice; and in other respects the terms and conditions of such lease shall be the same as those prescribed for Pastoral Leases within the Division in which the land is situated.

Timber Lands.

Subject to this Act and the Regulations made under it, the Minister, and every person he may appoint, either personally or as the holder of a public office, may, on application, and on payment of the prescribed fees, grant the following licenses for any period not less than one month and not exceeding twelve months:—

(1.) A timber license authorising the licensee to fell, cut, split, and remove any timber growing or standing on any Crown lands in the locality named in the license for the purpose of logs for sawmills, fencing, shingles, laths, buildings, or railway or other sleepers (but not to cut hewn balks, piles, telegraph or other poles), subject to the right of the Minister during the currency of such license to reserve from cutting over any part of the land in such locality.

A similar license must be obtained by every person engaged only in removing the timber dealt with under a timber license.

(2.) A woodcutter's or charcoal burner's license, authorising the licensee to cut or split firewood from any live or dead wood growing or lying on any Crown lands in the locality named in the license, and to remove the wood or charcoal cut, split, or burnt.

A similar license must be obtained by every person engaged only in removing the wood dealt with under a Woodcutter's or Charcoal-burner's license.

No license shall be necessary for cutting, obtaining, and removing dead wood lying on Crown Lands for domestic purposes, but not for sale.

(3.) A Sandalwood License, authorising the licensee to fell, cut, and remove any sandalwood growing upon any Crown Lands in the locality named.

(4.) A Wattle-bark License, authorising the licensee, during the months from August to December inclusive, or during any of such months, to strip and remove wattle-bark upon the Crown Lands in the locality named in the license.

(5.) A Bark License, authorising the licensee to strip and remove the bark, or to remove the gum from other trees than wattle, the bark or gum of which contains tannic acid, upon such terms as the Minister may think fit, upon the Crown Lands described in such license.

Digitized by Google

The Minister may, subject to this Act and the Regulations, grant a license to fell and hew timber to be used or exported as piles, poles, or balks. The fees for the several licenses hereinbefore mentioned are as follows:—Timber license, per month per man, 10s.; wood-cutter's or charcoal-burner's license, 5s.; sandalwood license, per month per man, 5s.; wattle-bark license, per month per man, 5s.; bark and gum license, 5s. per month per man; felling and hewing piles, poles, and balks license, £3 per month per man.

Timber Leases.—Timber leases may be applied for under the following conditions:—The maximum area allowed is 75,000 acres, at a rental of £20 per annum for each square mile or fraction thereof, payable in half-yearly instalments. The application must be accompanied by a deposit of a quarter or half-year's rent, as the case may be. The timber lease shall be granted for a term of not less than one year and not more than 25 years: Provided that any person or corporation holding a special timber license or licenses under the Land Regulations of 1887 shall have the right to hold the same under the provisions of this Act, notwithstanding the total area of such special timber license or licenses may exceed 75,000 acres.

A lessee of a timber lease shall, within two years from date of his lease, or within such longer period as the Minister may decide, erect within the area a substantial and fully-equipped sawmill plant, of sufficient power to cut up at least five loads of sawn timber per month for each square mile comprised in the lease, and shall keep the said sawmill plant in good working order during the whole term of the lease. The lessee is authorised to construct railways or tramways on and through his lease.

Timber Tramways.—Special provision is made for granting permission to construct timber tramways through Crown Lands at a rental of not less than £2 per mile.

Miscellaneous Provisions—Rents, Mortgages, Transfers, etc.

All land rents shall be calculated as from the 1st of January to the 31st of December, and shall be paid half-yearly in advance to the Minister, at the Office of the Department of Lands and Surveys, Perth, or to any Government Resident or Resident Magistrate, or other person authorised by the Minister to receive rents, on or before the 1st of March and 1st of September in each year. All leases applied for during the year shall be granted as from the first day of the quarter next preceding the date of approval of the application; and rent for the current half-year shall be payable as from the date of granting, and must be deposited with the application. If a lessee fails to pay the rent due by him on the 1st day of March or September in any year, he shall pay the same within thirty d the due day, together with a fine of twopence in the pou

Digitized by Google

if he fails to pay as last aforesaid, he shall pay the same within sixty days from the due date, together with a fine of sixpence in the pound; and if he fails to pay as last aforesaid, he shall pay the same within ninety days from the due date, together with a fine of 1s. in the pound; and if he fails to pay for ninety days, his lease and lands comprised therein, and all improvements thereon, shall be forfeited.

The names of all holders of land on which instalments of purchase money or rents are payable on the 1st of March and 1st of September shall be published in the *Government Gazette* during the months of January and July respectively in each year; and as early as practicable after the first day of March and first day of September in every year the Minister shall publish in the *Government Gazette* the names of the lessees in default, with the respective amounts of rents in arrears.

Mortgages.—Subject to the restrictions contained in Parts VIII. and IX. of this Act, and in the Homesteads Act, 1893, any lease or license under this Act, or under the Land Regulations of 1887, and "The Homesteads Act, 1893," other than license to quarry, and licenses under Part XI., may be mortgaged as hereinafter provided:—

(1.) When any such lease or license is intended to be charged with, or made security for the payment of any sum of money, the lessee or licensee shall execute a memorandum of mortgage in the form or to the effect of the twenty-fifth Schedule of this Act.

(2.) Every memorandum of mortgage must be in duplicate, and one original must be registered in the Department of Lands and Surveys; and in the case of several mortgages of the same holding, they shall take effect according to priority of registration.

(3.) A fee of 5s. shall be payable upon the registration of every such memorandum in respect of every holding comprised in or affected by it.

(4.) A mortgage may be transferred on payment of the like fee as for registration of the transfer.

(5.) On the occasion of the registration of every mortgage, or transfer of a mortgage, the lease or license must be produced.

Transfers.—Transfers must be accompanied by a fee of £1, and the lease or license transferred must be produced. Only one block can be transferred on one form.

Digitized by Google

Occupation of Land in Western Australia on 31st December, 1901 and 1902.

Particulars.	1901.		1902.	
	Area.	Area.	Area.	Area.
	acres.	acres.	acres.	acres.
I.—Absolutely Alienated:—				
Area sold by public auction or other forms of direct sale, or otherwise alienated, up to 31st December	..	3,468,878	..	3,517,724
II.—In process of Alienation on the 31st of December:—				
Midland Railway Concessions in process of alienation	2,768,810	..	2,768,810	..
Free Homestead Farms	283,455	..	365,468	..
Conditional Purchases	1,349,554	..	1,550,530	..
Selections from late W.A. Land Company	75,213	..	74,247	..
Selections under the Agricultural Lands Purchase Act	37,235	..	48,675	..
Special Occupation Leases and Licenses	8,867	..	7,057	..
Homestead or Grazing Leases	286,425	..	462,371	..
Poison Land Leases and Licenses	1,306,270	..	1,061,173	..
Immigrants' Grants	400	..	400	..
Village Allotments	6	..	7	..
Working Men's Blocks	31	..	130	..
		6,116,266		6,338,868
Total area alienated or in process of alienation on the 31st December ..	..	9,585,144	..	9,856,592
III.—Leases or Licenses in Force on 31st December:—				
Pastoral Leases	96,508,549	..	111,165,639	..
Special Leases	448	..	531	..
Leases of Reserves	5,296	..	3,301	..
Selections in Goldfields	3,955	..	2,653	..
Timber Leases and Licenses	865,180	..	889,540	..
Residential Lots	550	..	626	..
Total Leases and Licenses (exclusive of Mining Leases)..	97,383,978	..	112,062,290	..
Mining Leases	71,949	..	75,642	..
		97,455,927		112,137,932
IV.—Area neither Alienated, in process of Alienation, nor Leased ..	..	517,547,729	..	502,594,276
Total Area of Western Australia	..	624,588,800	..	624,588,800

Digitized by Google

2.—AGRICULTURAL BANK.

(Information supplied by W. Paterson, the Manager of the Agricultural Bank.)

Under "The Agricultural Bank Act, 1894," and the Amendment Acts of 1896, 1899, and 1902, advances can be made to holders of land in fee simple, under Special Occupation Lease, Conditional Purchase License, or under the provisions of "The Homesteads Act, 1893."

Advances.—Under "The Agricultural Bank Act, 1894," and the Amendment Act, 1896, advances are made for the purpose of effecting further improvements, but no advance is made upon any land which is otherwise encumbered, and none but first mortgages are accepted as sufficient. Under "The Agricultural Bank Act Amendment Act, 1902," advances on the security of improvements effected may be made for the purpose of (1) paying off liabilities existing on holdings; (2) carrying on farming, grazing, agricultural, horticultural, or viticultural pursuits; (3) adding to improvements already made on holdings.

No advance made under the principal Act (1894) may exceed three-fourths of the fair estimated value of the improvements proposed to be made on the holding; and at no time may any such advance or advances to any one person exceed Eight hundred pounds.

No advance under the Amendment Act of 1902 upon horticultural or viticultural land may exceed one-half of the fair estimated value of the land with the improvements already made thereon; and no such advance upon farming and grazing or agricultural land may exceed two-thirds of such value. At no time may any such advance or advances to any one person exceed One thousand pounds. In every case not less than one-third of the advance must be expended on improvements. No advance may be made for the sole purpose of paying off existing liabilities.

Form of Improvements.—Advances are made for the purpose of effecting either one or more of the following improvements:—Clearing, cultivating, or ploughing, ringbarking, fencing, draining, wells of fresh water, reservoirs, buildings, and any other form of improvement which, in the opinion of the manager, will increase the agricultural or pastoral capabilities of the land.

Proportion of Value of Proposed Improvements to be advanced.—In cases where, in the opinion of the manager, ample security is offered, *three-fourths* of the fair estimated value of the proposed improvements may be advanced, but *one-half* is the proportion generally allowed.

Mode of Payment of Advances.—All advances are paid proportionately as the improvements are effected, *i.e.*, applicants can have "draws" whilst the work is proceeding.

Rate of Interest.—Interest at the rate of Five pounds per centum per annum is charged upon all advances, and must be paid half-yearly,

Digitized by Google

on the 30th June and the 31st December in each year. Interest is only charged on the actual amount of the advance made or such proportion of the loan or loans as the applicant may have drawn.

Fees Payable.—All applications must be accompanied by a valuator's fee equivalent to one per cent. of the amount applied for. No charge is made for the purpose of drawing any mortgage or transfer.

Repayment of Loans.—All loans contracted under the principal Act have a currency of thirty years. During the first five years simple interest only is payable. At the expiration of five years from the first day of January or the first day of July, as the case may be, following the date of every advance, the borrower begins to repay the principal sum at the rate of one-fiftieth of the amount half-yearly, until the whole has been paid. Under the Amendment Act, 1902, where an advance is made to pay off existing liabilities, the borrower commences to repay such portion of the loan after the expiration of one year, at the rate of one-fiftieth half-yearly. Provided always, that the advance may be repaid sooner than is herein provided, and in larger instalments, at the option of the borrower. All applications must be for one or more of the following sums, viz. :—£50, £75, £100, and extending up to £800 under the principal Act, or to £1,000 under the Amendment Act, 1902.

Generally it will be found that the Bank practically advances only about one-half of the value of the work done. The institution has been largely patronised, and so far with great success. Thousands of acres have been cleared and brought under cultivation, which otherwise would still remain in their original state of unproductiveness.

The following is a summary of the operations of the Bank to the 30th June, 1902 :—

On that date the total amount of approved loans was £138,145, of which the sum of £113,506 had been paid to borrowers in progress payments, leaving a balance of £24,639 yet to be paid.

Improvements effected.—For the sum of £113,506, advanced by the Bank, the following improvements had been effected by applicants on their holdings, over which the Bank held mortgages as security :—Clearing 64,585 acres, costing £158,696 ; cultivating 46,215 acres, costing £36,879 ; ringbarking 67,076 acres, costing £7,517 ; fencing 29,883 chains, costing £10,080 ; drainage works, costing £629 ; wells, dams, and reservoirs, costing £4,844 ; farm buildings, costing £16,110 ; total, £234,818.

Improvements in Progress.—For the sum of £24,639 approved, but not yet paid, the following improvements were in progress, for which instalments were to be paid as the work proceeded. The cost of improvements in all cases is the valuation placed upon the work, and is based on the ruling prices in the various districts :—C
15,476 acres, costing £34,245 ; cultivation, 15,946 acres

Google

£11,031; ringbarking, 12,528 acres, costing £1,132; fencing, 7,014 chains, costing £2,589; drainage works, costing £427; wells, dams, and reservoirs, costing £3,707; farm buildings, costing £5,732; total, £58,863. From the foregoing returns it will be observed that for the sum of £138,145 loans paid and loans approved of but not yet paid, improvements of the value of £293,861 had been effected, or were in progress of being effected.

In his Report for the year ended 30th June, 1902, the Manager made the following statements with regard to the progress of the Bank:

"The profit and loss statement shows a profit on the year's transactions of £243 19s. 11d., so that with the balance brought forward from last year (£129 13s. 11d.) it will be observed that the Bank has made a profit of £373 13s. 10d. to the 30th June, last.

"The redemption period of loans has now fairly started; the number which had matured on 30th June, last, being 272, representing £31,775, the half-yearly payments on which amounted to £635 10s.

"Borrowers continue to keep their obligations to the Bank in a highly satisfactory manner; it being in very few cases that I have been compelled to take action to enforce payment.

"During the year under review, I have had occasion to sell three properties, all of which were abandoned by the holders. Their non-success may be chiefly attributed to lack of farming knowledge. As a rule very little difficulty is experienced in disposing of properties on which I have been compelled to foreclose, as the very easy mode of repayment allowed by the Bank gives the would-be farmer a chance of getting an improved property on unusually favourable terms.

"It has been found necessary to write off interest to the amount of £7 10s. during the year. This is the first and only loss made by the Bank since its establishment.

"It has been found necessary to appoint an inspector to assist the Manager in reporting on properties on which applications for loans are received, and since his appointment this officer has had his time fully occupied in that direction."

In connection with the management of the Bank, it must be noted that the funds are obtained either by sale of mortgage bonds, or from moneys provided by Parliament, the maximum to be raised being fixed at £300,000.

On the 30th June, 1903, the figures relating to Loans and Improvements were as follows:—Amounts advanced, £136,667; Improvements effected—clearing 76,306 acres, value, £184,856; cultivating 54,853 acres, value, £41,054; ring-barking 76,205 acres, value, £8,978; fencing 35,353 acres, value, £12,226; draining, value, £1,071; wells and reservoirs, value, £7,243; buildings, value, £22,494; total improvements effected, value, £277,922. Loans approved of £44,697. Improvements in progress—clearing 23,978 acres, value,

Digitized by Google

£50,244; cultivating 23,788 acres, value, £15,114; ring-barking 17,099 acres, value, £1,602; fencing 10,884 acres, value, £3,665; draining, value, £529; wells and reservoirs, value, £5,513; buildings, value, £7,914; total improvements in progress, value, £84,581.

3.—LAND TITLES.

(Information supplied by Alfred E. Burt, Registrar of Titles.)

Up to the year 1875, landed property in Western Australia was secured by registration of deeds, taking priority according to date of registration; and its transfer was effected by the ordinary system of conveyancing. This system still prevails as to all lands not under the operation of the Torrens system. The latter method of registration, which is very much less cumbersome in its application than that which it has superseded, was introduced by an Act of Parliament in 1874, which came into operation on the 1st July, 1875. The Transfer of Land Act of 1874 has subsequently been amended by other enactments passed in 1878, 1879, 1880 and 1883, and the whole law on the subject consolidated by "The Transfer of Land Act, 1893," which repealed all former Acts, and introduced many improvements. Since then there have been two further amending Acts, one in 1896 and one in 1902, both dealing with certain sections in the principal Act of 1893, which still remains the basis of the present Transfer of Land system.

All lands alienated by the Crown since the Transfer of Land Act came into operation are held under the provisions of that Act. Lands alienated before that date may be brought under its operation by application, on proof of title being furnished to the Commissioner of Titles, followed by advertised notice. The provisions of the Act allow of an inexpensive and simple manner of transferring, mortgaging, or otherwise dealing with lands included in Certificates of Title under the Act.

Existing encumbrances are endorsed upon the Certificate.

Trusts are not expressed upon the Certificate, but Declaration of Trust may be lodged, and may be protected by caveat.

A married woman may be registered in her own name.

These are some of the more especially noteworthy points. The advantages of the system as a whole can scarcely be over-estimated, it being particularly adapted to the circumstances of a colony. No great difficulty is experienced in its working, or in its application in connection with other enactments. The general legislation of England with respect to real property (subject to 57 Vict., No. 9, which makes real property distributable as personalty is) has be

Digitized by Google

time to time adopted by local enactment. Real estate is by statute made a legal asset in the hands of the personal representatives of a deceased debtor, in the same manner as personal estate, and may be sold and conveyed by an executor or administrator without any application to the Court.

As already mentioned, the old system of conveyancing still exists in Western Australia, by the side of the modern Transfer of Land system, as regards lands alienated before July, 1875, and not since brought under the operation of the Transfer of Land Act. The Colonial legislature, by 19 Vict., No. 14, provides for the registration of deeds, giving priority according to date of registration, and renders null and void all unregistered instruments relating to real property as against any subsequent *bona fide* purchaser or mortgagee for valuable consideration, excepting *bona fide* leases at rack rent for any term not exceeding 14 years.

In drawing conclusions from the following figures, as to the number of applications received during each year by the Commissioner of Titles, it must be borne in mind that only a small proportion of these are applications to bring land under the operation of the Transfer of Land Act, the number being 51 in 1900, 63 in 1901, and 58 in 1902.

Tabular View of the transactions under the Transfer of Land Act, from the commencement of its operation on the 1st day of July, 1875, to the 31st December, 1902.

Year.	Applications Received.	Applications Rejected.	Transfers Registered.	Mortgages Registered.	Leases Registered.
1875	31	3	1	1	..
1876	81	5	26	13	1
1877	108	5	38	34	1
1878	102	8	88	34	..
1879	105	8	103	43	1
1880	92	19	168	36	4
1881	107	10	143	70	3
1882	154	10	296	111	3
1883	173	9	349	144	4
1884	126	5	426	178	14
1885	152	6	633	216	7
1886	175	8	1,085	278	17
1887	136	4	733	303	16
1888	149	4	970	311	16
1889	164	8	912	271	21
1890	194	5	1,137	277	20
1891	262	6	2,277	366	29
1892	299	9	2,417	492	28
1893	220	8	1,828	520	34
1894	267	8	1,909	481	34
1895	361	5	2,934	684	56
1896	440	8	5,322	923	123
1897	646	16	6,924	1,387	174
1898	736	5	6,076	1,517	143
1899	648	8	4,742	1,319	125
1900	606	9	4,492	1,348	152
1901	708	11	5,456	1,589	149
1902	819	10	6,636	2,015	173

Digitized by Google

PART IV.—INDUSTRIES.

1.—AGRICULTURAL.

(By Alex. Crawford, Acting Director of Agriculture.)

Western Australia contains within its borders 624,588,800 acres of land. Up to the close of 1901, out of this vast area only 3,468,878 acres were alienated from the Crown, while at the same time 6,116,266 acres, selected under various Acts, were in process of alienation. In other words, the State had at that period only parted with a trifle more than ½ per cent. of the public domain.

There are still millions of acres available for selection within the South-Western, Southern, and Eastern Districts, and it is pleasing to note that settlers are largely taking advantage of the liberal land laws, and that the area under crop shows a healthy annual increase

The cultivation of cereals was for many years confined to the Greenough, Newcastle, Northam, York, Beverley, and Williams districts; but within the last few years it has extended some way beyond these, and is now in evidence from 125 to 150 miles East of the coast, along the Yilgarn Railway, and also to the North in the district lying round Northampton. Although in the Eastward portions of both these localities the rainfall is light, it seems to usually come about the right time of the year, and good returns, especially of hay crops, are then assured Grain would do well also, but on account of the seasons being very early, the farmers find that converting their crop into chaff and getting it into the market some weeks before other districts, pays much better than to let it ripen for grain. The land fit for wheat-growing in Western Australia is of very considerable extent, stretching from the Southern portion of the Great Southern Railway to some 25 miles North of Northampton. The quality of the wheat grown is very high, a fair average weight of the bushel being 63¼ pounds. In exhibition, against wheats from all other parts of the world, it has been able to more than hold its own, the Grand Prix at the late Paris Exhibition having been obtained by a five-ton lot sent from this State. The chief feature which, of late years, has attracted so many settlers from other places to this State, is the almost entire absence of droughts, together with the wonderful sufficiency and regularity of the rainfall, which, although not heavy in many districts, is so well distributed as to warrant the certainty of at least a fair crop. For many years past the general average of wheat for the whole State has exceeded ten bushels per

Digitized by Google

acre, and that in face of the fact that fertilisers are but little used. Most of the soils are rich in nitrogen and potash, but would be greatly improved by the addition of a phosphatic manure, a fact which the farmers are just now realising and commencing to take advantage of. With a greater use of phosphates there is no doubt but that the general average could easily be increased to at least 15 bushels per acre in an ordinary season. In a good season, farmers who have used phosphates have obtained as high as 35 bushels of wheat per acre, and that even in what are usually supposed to be the drier parts of the State. The soil and climate are so different to what farmers from the Eastern States have been accustomed to, that the best and most remunerative methods of dealing with the land have only recently been found out; and light soils, that since the early days of settlement have been considered almost useless, are now yielding heavy crops by the judicious use of phosphates.

Another factor in keeping down the general average yield of grain is the use in many places of old-fashioned, out-of-date machinery, and the lack of up-to-date appliances for sowing the seed and distributing the manure.

Most of the principal areas in Western Australia where the soil is suitable for wheat-growing are more or less heavily timbered. In the districts where until lately settlement was centred, the prevailing timber is York Gum (*Eucalyptus loxophleba*), and Jam Wood (*Acacia acuminata*). The latter derives its name, "Raspberry Jam," from the odour it gives out, so much resembling that of the well-known preserve. In the Eastern forest country, now being taken up for the purpose of cereal production, the prevailing timbers are Salmon Gum (*E. salmonophloia*), Gimlet Wood (*E. salubris*), and Morrell (*E. longicornis*). The soil is of a rich chocolate colour, and varies from a sandy loam to a heavy clayey loam. The heavy stiff soils are generally found in York Gum country, and in a good season they yield equally heavy returns. In many places the York gums are so dense that it is quite impossible to ride through them, and even difficult to walk; and when in this state, there is naturally but little grass to be seen. As soon, however, as the trees are ringbarked, the grass comes up in a most remarkable manner, and all kinds of stock fatten rapidly on it. The clearing of this heavy timber growth is not nearly so formidable as would be imagined. The heaviest of it can be ringbarked, and all small stuff under 8 inches in diameter cut down, for 5s. per acre; if the ringbarked trees are then allowed to stand for 12 months, and a fire is put through them, almost everything will disappear, and the plough can be put into the land at once. In other parts of Australia the special trouble with ringing is that a great growth of saplings immediately follows; but if the York Gum, Jam, or Wattle country in this State is ringbarked, and then stocked with sheep, they will keep all the saplings down, and prevent further expense, the sheep also doing well on

Digitized by Google

the newly-ringbarked country. By adopting this method of clearing, and using the stump-jump plough, the land may be cleared for 10s. to 12s. per acre.

The high prices that have been ruling for chaff and grain have had a bad effect on the farming of this State, and much of it has been of a very slip-shod kind. The chief aim of most of our farmers appears to have been to get as large an area of land under crop as possible, and its proper cultivation has then been neglected, while the same land has often been cropped year after year, without manure of any kind being used, or the land even fallowed, which course of treatment has naturally had a very detrimental effect in reducing the average yields.

In the coastal districts, extending from Fremantle towards the South, the rainfall is heavy and regular, and while not so well suited for wheat-growing, the land here gives enormous returns of oats, barley, and rye. Crops of oats averaging from fifty to seventy bushels per acre are nothing uncommon, while barley and rye will yield from 25 to 45 bushels. Each year sees a largely-increasing area of these crops under cultivation.

Much of the land in these districts is admirably adapted for dairying, as green feed can be grown all the year round, and there is an abundance of good water. Up to the present dairying has been but little engaged in, although those who have gone in for it have been most successful. The reason for this neglect is that grain, hay, chaff, and potatoes have been bringing such high prices that the farmers have not cared about undertaking the heavy and constant work of dairying. Of all farm work, that of dairying seems to be the most disliked, and here, as in all the other States, there is ever the difficulty of getting milkers, as even where the farmer has a large family working, the young people will rather leave the farm and go elsewhere than remain at home to dairy. So long as the State continues to prosper as at present, there will not be much expansion in the dairy business; but there appears to be no doubt as to its possibilities as a profitable industry if pursued in future on modern lines. It is satisfactory to know that some effort is being made to supply milk to the goldfields from local supplies, as hitherto the fields have been dependent entirely on imported products. In the South-West District a factory has been opened for the purpose of manufacturing concentrated milk, and although the supply of milk during its first season was not very great, the price that was paid for it was such as is likely to tempt others to send their milk in, and there is a fair prospect of this business ultimately developing into a large industry.

One of the best openings that exist in the agricultural line in this State is that of cheese-making. There is not a cheese factory in the country, nor is there any cheese privately made for sale. Good

Digitized by Google

new cheese, which is in much greater demand than the matured article, would always command a fair price—at least 9d. or 10d. per pound and at this price—there is no other farm industry that would pay so well.

Much of this portion of our agricultural land is also particularly well suited for potato-growing, and two crops a year are obtained in many parts of it. The potatoes grown locally are of excellent quality, and in the Blackwood District a ten-ton crop per acre is not exceptional, even without the use of manure of any kind. The soil here will also grow maize, sorghum, and similar crops, as well as mangels, swedes, turnips, etc. Linseed is another crop that does well, and in the future there will in all probability be a large trade done through the production of flax fibre, some that has been grown here having been pronounced equal to that produced in any part of the world.

One feature of farm work that has been much neglected, and yet one which offers large returns, is that of keeping stock on the farms. It is almost exceptional to see a flock of sheep on a farm, and, as a rule, few cattle are kept, except where dairying is practised. In nearly all the wheat-growing districts the land produces good, fattening grasses, and throughout the country thousands of acres of magnificent grass may be seen going to waste, by utilising which even on small farms an extra £100 per year could easily be made by the keeping of stock.

To the experienced wheat-grower, the all-important question in considering the prospects of a given district is the amount and distribution of rainfall. It has been found that there are at present large areas of unutilised rich land within the 14-inch rainfall belt. The seasons in the portion of the State referred to appear also to be fairly reliable. At the latitude of the Yilgarn Railway (31° 30″), this belt runs out to Kellerberrin, some 70 miles East of Northam, and it gradually widens in its easting as it runs towards the Great Australian Bight. Such an event as a heavy drought through the South-Western portion of the State is practically unknown, but the average yearly rainfall is greater in proportion to its proximity to the Western coast; thus at the town of York the mean for 20 years was found to be 17½ inches; at Pingelly—on the Great Southern Railway—the average appears to be about the same; at Wagin, on the same line, it is approximately 18 inches; on the coast, at Bunbury, the average is 36½ inches, in Perth 33 inches, and at Fremantle 30 inches. Throughout the Sussex and Blackwood districts, the average is from 40 inches on the coast to 32 inches on the Eastern boundary of the Blackwood.

With almost unfailing regularity the season breaks in April or May, and then up to September or October there is always a good rainfall, it being some years, of course, much heavier than others. The one drawback to the Eastern District is that, at times, the rain suddenly drops off in September. From September or October to the

Digitized by Google

break of the season again there is no rainfall, save an occasional thunderstorm ; whatever rain falls is, therefore, almost wholly confined to the growing season. The regularity of the seasons in the South-West portion of Western Australia is due to the fact that the chief supply of moisture for that part of the continent is drawn from the inexhaustible resources of the Indian Ocean, whose warm moisture-laden breezes are condensed and precipitated on coming into contact with the colder air lying on the surface of the land.

The finest lands to the Eastward of Northam are peculiarly favoured so far as a market is concerned, by their proximity to the Eastern Goldfields, which are situated in a comparatively arid belt of country, their population consequently being dependent for its food supplies upon those who live in districts where there is an annual rainfall sufficient to mature a crop. Realising this fact, a number of settlers have taken up land both to the North and South of the Northam-Kalgoorlie railway line, which is rapidly being brought under cultivation.

The forest lands—in this section— can be cleared one inch below the surface for less than 20s. per acre. The method now coming into general use is as follows :—The timber up to 10 or 12 inches in diameter at the ground is chopped down level with the surface ; whilst the larger trees are ringbarked, also level with the ground. This is done during June, July, and August. The ground is then left until the following February. As most of the rung trees are hollow, many of them blow down during the intervening months, while the leaves and limbs which drop furnish ample material to carry a fire ; a suitable day in February is then chosen, and a running fire put through the whole of the land so treated. The clearing can then be completed for about 9s. per acre, the preliminary work having already cost a similar amount. The soil throughout this section is extremely loose and friable, and can be turned over at any time of the year ; but the plough works better in summer than in winter, as during the latter period the soil is very sticky, and clings to the mould-board.

At Tammin, 50 miles East of Northam, there are several settlers living on the class of land above described ; they have now been there some years. and have amply demonstrated that wheat-growing can be made a success in that section even during very dry periods. They grow chiefly wheaten hay for the goldfields, their proximity to which gives them a decided advantage over the districts further West. At Mooranoppin, 20 miles more to the Eastward, wheat has for years successfully been cultivated on a light, sandy soil, of which there are thousands of acres available in the neighbourhood. By fertilising this class of soil with Abrolhos guano fine yields of hay have been obtained, and it has been found that the crops on the light soil stand the heat better than they do on the forest land in the section. Some crops average 30cwts. of wheaten hay to the

Digitized by Google

The "total area under crop" in the State during the year ended February, 1902, was 217,441 acres, as against 201,338 acres in the previous year. If there be added to the acreage under crop 11,711 acres under *permanent artificially-sown grasses*, 25,908 acres *cleared and prepared for immediate use*, and 57,514 acres of land *in fallow*, the area of arable land at the close of the season 1901–2 will show a total of 312,574 acres.

The average area under crop per head of the mean population of the State during the ten years, 1892 to 1901, was as follows :—

Year.	Acres per Head.	Mean Population.
1892	1·43	55,847
1893	1·36	61,690
1894	1·08	75,055
1895	1·08	90,148
1896	0·91	122,696
1897	0·86	155,563
1898	1·02	168,999
1899	1·11	168,528
1900	1·14	177,073
1901	1·15	188,603

The foregoing figures might lead the reader to infer that there had been a serious falling off in the acreage under crop up to the year 1897, when it was only 0·86 per head; but when it is taken into consideration that the mean population increased from 55,847 in 1892 to 155,563 in 1897, and the acreage under crop from 79,605 acres for the season 1892–3 to 133,183 acres in 1897–8, and to 217,441 acres in 1901–2, it can be seen that there was a substantial increase during the nine seasons.

The following table indicates the progress in land cultivation during the same 10 years :—

Return of Acreage of some of the Principal Crops in Western Australia for the Ten Years, 1892–1901.

Year.	Wheat.	Barley.	Oats.	Maize.	Potatoes.	Hay of all kinds.	Green Forage.	Vines.
	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.
1892	35,061	3,666	1,695	33	529	35,124	214	1,218
1893	42,673	3,603	2,571	37	630	29,590	359	1,643
1894	21,433	1,949	1,635	27½	703	49,896	281½	1,863
1895	23,241	1,932	1,880	23	668	63,804	430	2,217
1896	31,488½	1,903	1,753	30¼	720¼	69,436¼	815¼	*2,294
1897	38,705½	1,693¾	1,677¾	243¼	1,361½	80,938¼	961¾	2,654¼
1898	75,031¾	2,185¾	3,072¼	110¼	1,675½	79,223¾	564¼	2,960½
1899	84,462½	3,885	3,939½	133½	2,837	78,892¾	708	3,244¾
1900	74,307¾	2,535¾	4,789½	91	1,794	104,254½	1,023¼	3,325
1901	94,709½	2,068¼	9,751	512¼	1,828¾	92,653¾	1,563¼	3,629

* It must be pointed out that the acreages under "Vines" and "Fruit Trees" since 1896 have been compiled on the basis of the actual number of vines and fruit trees planted according to a standard supplied by the Bureau of Agriculture, which allows 600 vines and 100 fruit trees to the acre; a comparison between the figures of 1896-7 and those of previous years is therefore *valueless*.

Digitized by Google

During the years 1894 to 1897 the chief cereals suffered considerably owing to the attention devoted to the raising of hay and green forage to supply the enormous demand for fodder on the goldfields; while the acreage under wheat decreased from 42,673 acres in 1893 to 21,433 acres in 1894, there was an increase in the acreage under hay of 20,306 acres; since 1894 there has been a substantial annual increase in the acreage under wheat, the area under that crop for the season ending 28th February, 1902, showing an increase of 20,401¾ acres over the previous year. Oats also show a considerably extended acreage. An area of 1,828¾ acres was devoted to the potato crop, an increase of 34¾ acres over the previous year.

The following returns show the

Total Yield of the Principal Grain, Hay, and Root Crops in Western Australia for the Ten Years, 1892–1901.

Year.	Wheat.	Barley.	Oats.	Maize.	Potatoes.	Hay of all kinds.
	bushels.	bushels.	bushels.	bushels.	tons.	tons.
1892 ..	406,350	54,450	31,534	719	1,937	40,880
1893 ..	520,198	47,329	47,603	573	2,309	34,196
1894 ..	170,351	14,921	20,246	756	2,545	38,456
1895 ..	180,077	18,691	19,326	600	2,290	53,758
1896 ..	243,928	12,816	18,871	504	2,089	50,500
1897 ..	408,595	23,423	29,266	4,826	4,270	75,464
1898 ..	870,909	29,295	55,854	1,365	5,698	77,297
1899 ..	966,600	56,587	73,555	2,263	8,373	70,078
1900 ..	774,653	29,188	86,433	1,399	4,836	103,813
1901 ..	956,885	34,723	163,653	5,203	5,739	89,729

It will be noticed that in the year 1899 the quantity of potatoes grown was 8,373 tons, while in the following year it dropped to 4,836 tons. This is to be accounted for by the fact that, owing to the abnormally high prices that potatoes reached in 1898, the farmers throughout the State put in almost double the areas they had in before, and, unfortunately for themselves, almost all put in the early sorts that will not keep, with the consequence that hundreds of tons were rushed on the market, and were almost unsaleable, while in many cases the crop would not even have paid for the digging. The following season the farmers went to the opposite extreme, and prices again were very high.

In 1900 the wheat return shows a falling off of nearly 200,000 bushels from the previous year's output, but the hay output showed an increase of over 30,000 tons. This was due to the enormous demand there was for chaff, and the high prices obtaining for it

in the early part of the season, consequently much of the crop that was intended for grain was cut for hay. The market then fell through an over supply, and the following season (1901) saw the hay crop once more down to its normal level, while the grain crop had proportionately risen.

So far as the fluctuations in the production of maize are concerned, the demand for it is very uncertain, and the prices depend altogether on the season in the Eastern States. When the price is low here, many other crops pay much better, and naturally there is but little sown the following season.

The Average Yields per Acre of the principal Grain, Hay, and Root Crops in Western Australia for the Ten years, 1892–1901, were as follows :—

Year.	Wheat.	Barley.	Oats.	Maize.	Potatoes.	Hay of all kinds.
1892	11·6	14·9	18·6	21·8	3·7	1·2
1893	12·2	13·1	18·5	15·4	3·7	1·2
1894	7·9	7·7	12·4	27·5	3·6	0·8
1895	8·1	9·7	10·3	26·1	3·4	0·8
1896	7·7	6·7	10·8	16·7	2·9	0·7
1897	10·6	13·8	17·4	19·8	3·1	0·9
1898	11·6	13·4	18·2	12·4	3·4	1·0
1899	11·4	14·6	18·7	17·0	3·0	0·9
1900	10·4	11·5	18·0	15·4	2·7	1·0
1901	10·1	13·0	16·7	11·5	3·1	0·9

It will be seen from the foregoing tables that the production of wheat, from a minimum of 170,351 bushels in 1894, attained to 956,885 bushels in 1901, whilst the average yield per acre fell as low as 7·7 bushels in 1896, owing probably to the bringing under cultivation of a large area of the lighter lands, and only amounted to 10·1 bushels in 1901, the maximum (12·2 bushels) having been obtained in 1893.

Digitized by Google

The following table shows the quantity available, the requirements, production, and deficiency of wheat per head of mean population for the years 1896–1901 inclusive :—

Year.	Mean Population.	Wheat per head of mean population.			
			Requirements, Production, and Deficiency.		
		Quantity available for Food.	Gross requirements of Wheat for Seed and Food.	Home production of Wheat.	Deficiency.
	No.	Bushels per head.	Bushels per head.	Bushels per head.	Bushels per head.
1896	122,696	8·1	9·1	1·5	7·6
1897	155,563	7·2	8·1	1·6	6·5
1898	168,999	7·5	8·5	2·4	6·1
1899	168,528	7·8	8·9	5·2	3·7
1900	177,073	7·6	8·7	5·5	3·2
1901	188,603	7·7	8·8	4·1	4·7

The deficiency of wheat showed a decrease from 7·6 bushels per head of mean population in 1896 to only 3·2 bushels in 1900, which was followed by a slight rise to 4·7 bushels in 1901. The home production of wheat, and the deficiency to be made up by importation from the Eastern States, serve to show on the one hand how largely local supplies are increasing consequent on the increased attention now being paid to the growth of cereals, and, on the other hand, the effect which this fact has upon the importation.

Previous to 1896 the collection of the agricultural, live stock, and industrial statistics of each magisterial district was intrusted to the Resident Magistrates, from whose abstracts or reports the Registrar General compiled the returns. In the year mentioned above a new system was inaugurated, by which each holder of land of one acre in extent and upwards, the owner or person in charge of live stock, and the head of every industrial establishment, were asked to fill in schedules provided by the Registrar General. These schedules detail all the particulars required *re* land, stock, and industry. The Resident Magistrates acted as statistical agents and the police as collectors, and the schedules for each district were sent direct to the Registrar General for tabulation. The new system was found to be a vast improvement on the old, and on the 23rd December, 1897, the Industrial Statistics Act was assented to, embodying the new system of collection, and making it compulsory for all persons concerned to furnish returns as required by the Registrar General.

Digitized by Google

Total Acreage of the principal Grain Crops, and the Hay and Potato Crops, in the various Electoral Provinces and Districts, for the Seasons 1900 and 1901.

Electoral Provinces and Districts.	1900.					1901.				
	Wheat	Oats.	Barley.	Hay.	Potatoes.	Wheat.	Oats.	Barley.	Hay.	Potatoes
	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.
CENTRAL PROVINCE.										
Electoral District—										
Cue	..	..	..	..	..	..	..	..	..	..
Geraldton	118	..	..	438·5	..	132	12	..	512	·25
Greenough	4,354	299	661	9,273·5	12·3	5,251	354	703	7,026·75	4·75
Irwin	3,037	172	191	4,206	8·2	3,641	225	280·5	3,173·75	1·75
Mt. Magnet	..	..	..	10	..	..	..	..	10	..
Murchison	755	87	33	1,951	10·5	823·5	109	32	1,515	12·88
North Murchison	..	..	..	..	..	..	..	..	..	..
Total	8,264	558	885	15,879	31	9,847·5	700	1,115·5	12,237·5	19·63
EAST PROVINCE										
Electoral District—										
Beverley	8,554·2	428·2	177	7,731·3	6	11,555·25	951·5	210	6,981	5·13
Moore	3,526	476	73	4,828·5	38·5	3,766	771·75	157	4,808·5	66·25
Northam	14,504·5	842	387·5	22,410·2	14·8	17,094	1,203	346	19,123·5	22·75
Swan	183	85	17	3,366	84·5	193·5	126	6	3,257·75	92·75
Toodyay	8,253	586·5	238	7,265·3	7	11,664·25	1,352·75	189	6,843	12·5
York	10,440	427·5	275·5	11,593·7	9·5	12,994	670	227·5	8,457·5	6·63
Total	45,460·7	2,845·2	1,168	57,195	160·3	57,267	5,075	1,135·5	49,471·25	206·01
METROPOLITAN PROVINCE										
Electoral District—										
Perth										
East Perth	2	2	..	92	93·7	2	3·5	..	191	161·75
North Perth										
West Perth										

Digitized by Google

Metropolitan-Suburban Province.										
Electoral District—										
Claremont	..	..	..	0·5	13·3	·5	..	..	·75	13
Guildford	11	..	1	582·8	13·2	61	22·75	6	613·5	16·13
South Perth..	1	..	..	66	27·3	12	..	..	96·5	21
Subiaco	..	1	..	80·2	9·2	1	5	..	35	5·5
Total	12	1	1	729·5	63	74·5	27·75	6	745·75	55·63
North Province.										
Electoral District—										
Gascoyne	..	..	..	26	..	..	..	..	20	..
East Kimberley	..	..	..	..	..	..	..	..	..	..
West Kimberley	..	..	..	..	..	..	..	..	5	5
Pilbara	..	..	..	..	..	..	..	..	..	..
Roebourne	..	..	..	..	..	..	..	..	..	..
Total	..	..	..	26	..	..	..	..	25	5
North-East Province.										
Electoral District—										
Boulder										
Hannans	..	..	..	..	..	..	..	..	..	·5
Kalgoorlie										
Kanowna	..	..	..	..	..	..	..	..	..	..
Mt. Margaret	..	..	..	21	..	..	..	..	..	..
Menzies	..	..	..	..	..	..	..	..	..	..
Total	..	..	..	21	..	..	..	..	..	·5
South Province.										
Electoral District—										
Mt. Burges										
Coolgardie	..	..	..	2	..	..	..	..	..	..
Dundas	57·5	4	..	699·3	8·5	32	2	1·5	830·5	4·25
Yilgarn	2	..	..	..	..	3	..	..	..	..
Total	59·5	4	..	701·3	8·5	35	2	1·5	830·5	4·25
South-East Province.										
Electoral District—										
Albany	4,141·3	176	64·3	4,111·7	237	5,032	537·5	25·5	3,819·25	227·13
Plantagenet										
Williams	14,706·5	656	277·5	12,185	5	20,730·5	2,371	307·75	12,677·5	22·75
Total	18,847·8	832	341·8	16,296·7	242	25,762·5	2,908·5	333·25	16,496·75	249·88

Digitized by Google

Total Acreage of Principal Grain Crops, etc.—continued.

Electoral Provinces and Districts.	1900.					1901.				
	Wheat.	Oats.	Barley.	Hay.	Potatoes.	Wheat	Oats.	Barley.	Hay.	Potatoes.
SOUTH-WEST PROVINCE.										
Electoral District—	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.
Bunbury	125	60	9·2	1,295	187·3	132·5	109·5	4·5	1,145·5	186
Murray	595·3	112·5	42·5	4,096·2	171·3	545·75	270·75	22·5	3,691·5	133·38
Nelson	354·5	155	46·5	1,378·5	69·5	406	216·5	27·5	1,492·25	71·5
South-West Mining	33	15	0·5	515	27·7	39	58	..	560·5	30·75
Sussex	123	17	5	908·5	133·5	123	42	..	792·75	124·25
Wellington	414·7	178·7	35	4,442·5	495	447·75	302·5	22·5	4,290·75	475·75
Total	1,645·5	538·2	138·7	12,635·7	1,084·3	1694	999·25	77	11,973·25	1,021·63
WEST PROVINCE.										
Electoral District—										
Cockburn Sound	16·3	9·2	1·3	640·5	101·2	27	35	..	668·75	102·5
Fremantle										
East Fremantle	..	..	..	37·5	10	..	..	..	14	2·0
North Fremantle										
South Fremantle										
Total	16·3	9·2	1·3	678	111·2	27	35	..	682·75	104·5
Grand Total. Western Australia	74,307·8	4,789·6	2,535·8	104,254·2	1,794	94,709·5	9,751	2,668·75	92,653·75	1,828·78

The above table shows that the acreage under wheat in the Northam Electoral District increased from 14,504 acres in 1900 to 17,094 acres in 1901; in the Williams District, from 14,706 to 20,730 acres; in the Beverley District, from 8,554 to 11,555 acres; in the York District, from 10,440 to 12,994 acres; in Toodyay, from 8,253 to 11,664 acres; in Greenough, from 4,354 to 5,251 acres; and in the whole of the State from 74,308 to 94,709 acres. In oats, the Williams District heads the list with 2,371 acres for 1901. Greenough with 703 had the largest acreage sown with barley. Northam, probably owing to its favourable position with respect to the goldfields market, cut the largest area for hay, viz., 19,123 acres; whilst Wellington showed 476 acres in potatoes, over one-fourth of the entire area under this root crop in the State.

Digitized by Google

The following returns, while they show in some lines that the production is rapidly overtaking the demand, at the same time emphasise the necessity of, and advantages to be obtained by developing the undoubted productive capabilities of the State, and conclusively prove the abundant opportunities there yet are for enterprise in the direction of locally producing many foodstuffs which are now largely imported from the Eastern States :—

Declared Customs Values of certain Agricultural Produce imported into Western Australia during the ten years 1892–1901.

Articles.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	Totals.
	£	£	£	£	£	£	£	£	£	£	£
Arrowroot, Tapioca, Sago Cornflour, and others, N.O.E. ..	1,216	1,720	2,513	4,722	6,679	6,870	8,843	8,753	11,601	10,210	63,127
Barley	2,177	1,144	1,381	1,747	1,918	5,140	4,998	3,571	3,175	6,188	31,439
‡Beans	..	..	84	277	352	520	408	241	209	495	2,586
*Bran	14,135	11,485	7,697	20,865	43,394	40,272	29,813	34,305	33,785	48,073	283,824
†Chaff	15,753	2,060	37,367	50,298	70,951	55,969	8,389	2,399	8,298	3,772	255,256
Flour	48,323	46,120	44,300	62,712	152,135	197,519	156,411	75,159	66,028	85,378	934,085
‡Flour (Self-raising)	..	..	175	438	559	762	598	417	350	319	3,618
Hay	..	..	378	1,521	2,294	3,051	1,261	716	2,253	773	12,247
Hops	3,768	2,354	3,712	4,706	8,531	10,723	12,941	15,055	13,948	14,418	90,156
Maize and Gram	1,155	79	543	777	1,505	2,653	2,850	1,591	1,293	1,554	14,000
Malt	1,713	2,759	5,537	9,834	19,302	27,933	28,932	41,539	26,739	81,574	195,862
Oatmeal	2,325	2,974	6,023	5 353	9,698	11,092	11,747	10,263	11,982	12,424	83,881
Oats	28,404	26,982	42,916	116,207	117,233	109,719	81,878	69,559	77,553	88,163	758,614
Onions	1,329	1,234	3,254	3,989	10,620	13,545	11,887	8,801	8,062	15,381	78,102
‡Peas	..	..	996	1,413	1,760	1,588	1,663	2,185	1,653	1,832	13,090
Pollard	..	..	3,208	5,779	7,615	6,622	6,906	9,026	8,655	14,342	62,153
Potatoes	7,238	7,147	10,121	10,219	33,601	43,795	69,430	28,130	24,570	57,029	291,280
Rice	6,628	7,364	7,794	6,421	11,245	12,925	16,897	12,277	14,174	12,892	108,617
‡Rye	..	..	..	14	24	113	55	37	47	58	348
Wheat	17,376	2,189	3,307	17,812	40,120	51,282	56,906	11,714	11,446	29,679	241,831
Total Value of Imports of Agricultural Produce	151,540	115,611	181,306	325,104	539,536	602,093	512,813	335,738	325,821	434,554	3,524,116

* Previous to 1894, pollard was included under this heading. † Previous to 1894, hay was included under this heading.
‡ In cases where blanks occur, the article was probably classified under some general heading, and not particularly specified.

Digitized by Google

Comparing the imports for 1901 with those for 1900, it will be seen that there was an increase of £3,103 in the value of barley, £14,288 in bran, £19,350 in flour, £470 in hops, £261 in maize and gram, £4,835 in malt, £442 in oatmeal, £10,610 in oats, £7,319 in onions, £5,687 in pollard, £32,459 in potatoes, and £18,233 in wheat; while there were decreases of £1,391 in the value of arrowroot, tapioca, sago, cornflour, etc., £4,526 in chaff, £1,480 in hay, and £1,282 in rice.

Declared Customs Values of certain Farm Yard and Dairy Products imported into Western Australia, from 1892 to 1901 inclusive.

Articles.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	Totals.
	£	£	£	£	£	£	£	£	£	£	£
Bacon	9,111	11,871	16,168	26,193	56,858	64,455	67,443	69,913	78,533	83,597	484,142
†Beeswax	..	..	13	17	53	92	47	43	110	99	474
Butter	29,059	36,148	50,354	73,999	148,971	188,478	195,467	184,239	204,457	247,808	1,358,980
Cheese	7,064	6,870	7,235	11,201	20,118	20,300	21,058	19,036	23,257	26,104	162,243
Eggs	1,874	2,122	4,996	11,920	33,389	51,429	52,667	50,682	60,465	57,430	326,974
*Hams	..	..	3,683	5,435	11,324	13,693	11,492	14,057	18,518	21,340	99,542
Hides	624	293	237	6	74	10	8	13	..	1	1,266
†Honey	..	..	595	1,340	2,831	2,239	2,952	2,145	2,071	1,446	15,619
Lard	921	747	550	680	1,139	1,043	1,433	1,146	1,115	1,115	9,889
Meats (fresh, salt, and preserved)	22,337	16,971	44,329	50,214	87,183	82,212	73,989	71,029	86,165	81,730	616,159
Milk (preserved, and compounds thereof)	8,048	9,792	17,639	37,167	47,466	73,799	73,198	59,681	80,778	78,115	485,683
Poultry (alive and dead)	165	245	542	1,786	3,846	6,618	3,034	2,004	1,529	2,152	21,921
Tallow	1,816	234	334	980	565	254	170	41	217	29	4,640
*Tongues	..	..	2,269	5,775	11,443	10,872	9,347	9,826	15,084	9,720	74,336
Total Value of Imports of Produce	81,019	85,293	148,944	226,713	425,260	515,494	512,305	483,855	572,299	610,686	3,661,868

* Previous to 1894 included in "Bacon."

† In cases where blanks occur, the article was probably classified under some general heading, and not particularly specified.

Digitized by Google

From the foregoing return it is clearly evident that the imports of bacon, butter, cheese, eggs, and lard are increasing yearly; not because the State is incapable of producing these articles, but because during the last four or five years the demand was so great for hay and grain that the agriculturists, to the exclusion of the other important branches of agricultural industry, devoted all their energies to the production of those staples. Steps have lately, however, been taken in the direction of improving this unnatural state of affairs. With this view, the Government have purchased a number of thoroughbred bulls, which are distributed through the districts where dairying can profitably be carried on. A butter factory has been erected at the Vasse, and by these and other means an impetus has been given to the dairy industry, which, it is anticipated, will result beneficially to producers and consumers alike.

There was a slight falling off in the imports of preserved milk, cream, etc. (£2,663), during 1901, as compared with 1900. When it is understood that the amount of milk and cream brought into the State during the last two years was invoiced at £158,893, there must surely be a fine opening for this branch of the dairying industry in the South-Western and Eastern Districts, connected as they are by railway with Perth and Fremantle and the several large and rapidly growing towns upon the Eastern goldfields.

During the year 1900, 3,556 hives of bees produced 138,787lbs. of honey and 3,158lbs. of wax, while we imported no less than 130,038lbs. of honey and 1,930lbs. of beeswax, during the same period. In 1901, 3,880 hives of bees produced 142,082lbs. of honey and 2,978lbs. of beeswax, the imports during that year amounting to 86,916lbs. of honey and 1,682lbs. of beeswax.

There was a decrease of £4,435 in the total value of fresh, preserved, and salted meats imported in 1901 as compared with 1900. In 1900 Western Australia imported 660,387lbs. of fresh meats, valued at £8,167; in 1901 the imports were 473,944lbs., valued at £7,865; preserved meats also decreased from £71,408 to £67,352.

These facts, taken into consideration with the large number of live stock for slaughter introduced into the State during the same period, show conclusively that there are splendid opportunities in Western Australia waiting to be availed of by graziers and farmers generally.

While satisfactory progress has been made in some branches of farming, the production of the above-mentioned articles, together with poultry, honey, beeswax, etc., could be profitably carried on within this State to an almost unlimited extent.

Digitized by Google

Taking all classes of land selection together, including Pastoral Leases, the year's transactions show a decrease in the acreage of selections approved for the year, as compared with 1900, of 17,325,686 acres, made up by decreases of 17,247,142 acres in pastoral leases, 73,340 acres in timber leases, other leases 4,831 acres, sales and grants 1,534 acres, and lands absolutely alienated by Conditional Purchase, etc., 41,034 acres; while there was an increase in Conditional Purchase and other selections of 42,195 acres.

The re-purchase of the West Australian Land Company's areas, which, though completed previously, was not taken into account in the return of alienated lands until 1897, reduced the total area shown in the returns as alienated by 2,823,196 acres, and the acquisitions also effected under the Agricultural Lands Purchase Act caused a further reduction by 38,568 acres, leaving the total area alienated, or in course of alienation, on the 31st December, 1898, as 6,292,421 acres, compared with 6,024,638 acres for 1897. The total area at the end of 1901 was 6,816,334 acres.

During the year ended 31st December, 1901, the Crown Lands Department approved of 405 applications for free homestead farms, covering 63,623 acres; 1,389 conditional purchases, covering 209,709 acres, exclusive of 28 applications for 4,295 acres under the Agricultural Lands Purchase Act; 56 homestead leases, covering 64,834 acres; 8 poison land leases, comprising 9,530 acres, and two working men's blocks being 8 acres, making a total 1,888 applications for 351,999 acres. The department also approved of 1,466 leases and licenses, without the option of future alienation, covering 20,019,575 acres. Among the number were 519 pastoral leases, comprising 19,909,251 acres, and 24 timber licenses for 109,630 acres.

There was an increase in the timber rents of £2,997, and in ordinary rents of £5,224, while there was a falling off in sales of £9,303. This was partly due to the decrease in goldfield sales, owing to the granting of residential leases at a nominal rent.

Of the areas originally granted to the West Australian Land Company, under the provision of the "Hordern Contract," for the construction of the Great Southern Railway, nearly three millions of acres came back into the hands of the Government on the purchase of the railway and other assets of the Company. When the lands were thrown open on the 11th of February, 1897, there was a rush for selections, particularly in those portions of the area more especially favoured as regards railway facilities. The first rush being over, the selections during 1898 were considerably less than in 1897, though they were sufficient in number to show that settlement in that part of the State still proceeded at a satisfactory rate. Since then the land has been taken up in this area to a large extent, the

Digitized by Google

acreages for 1900 and 1901 being respectively 177,176 and 135,283 acres.

The transactions under the Agricultural Lands Purchase Act show that the Government acquired, by re-purchase, up to the end of 1901, the Coondle, the Mt. Hardey, the Throssell, the Warding, the Clifton, the Norman, and the Homebush estates, comprising altogether 46,624 acres, at a cost of £52,864. In purchasing these estates the Government borrowed £27,391 from the Post Office Savings Bank, at 4 per cent.; and £25,473 was paid by debentures bearing 3 per cent. interest. The gross amount of interest and principal due at the end of 20 years, when the loans mature, will be £90,060. The areas available for selection, after deducting for roads, reserves, etc., amount to 46,165 acres, out of which 184 selections, covering 37,235 acres, were sold up to the end of 1901, leaving 7,929 acres open for selection. The revenue from this source, received to the end of 1901, was £14,451; and it is calculated that the 20 years' revenue on the prices fixed will amount to £96,838.

During the year ended 31st December, 1901, the Crown Lands Department sold 1,366 town and suburban allotments, covering 856 acres.

There were 313 reservations, covering 189,856 acres, set aside for various public purposes during the year 1901, as against 357 reservations, comprising 228,060 acres, in 1900.

During the twelve months ended 31st December, 1901, 1,069 conditional purchases, other holdings, and reserves were surveyed by the Crown Lands Department, comprising an area of 244,383 acres; 1,282 miles of roads, rivers, traverses, etc.; 311 agricultural areas; covering 47,422 acres, and 2,501 town lots were also surveyed by officers of the department.

Digitized by Google

Particulars of Agricultural Areas

Name.	Total acreage of Area.	Acreage of Blocks Surveyed.	Estimated cost of clearing at per Acre.	Situation of Area.	
				Miles from Perth.	Miles from nearest Town.
Appertarra ..	6,564	13 to 827	£3	341	Adjoins Northampton ..
Bainding	55,000	160	£5	156	90 from Northam ..
Beverley	35,000	100 to 296	£3 to £4	103	5 " Beverley ..
Bowes	16,250	100 to 651	£3 to £4	337	3 " Northampton ..
Boyanup	47,954	100 to 298	£5	131	16 " Bunbury ..
Caljie	12,500	190 to 500	£3	65	5 " York .. ..
Collie	7,150	100 to 160	£5	102	8 " Bunbury ..
					25 " Collie Coalfields
Coolup	33,303	120 to 160	£6	56	2 " Pinjarra ..
					59 " Bunbury ..
Dalaroo	4,025	160	£4	98	At Moora .. ..
Dalyup	13,000	66 to 204	£3	575	19 from Esperance ..
Darkan	12,450	146 to 703	£4	222	30 " Wagin Lake ..
Doodlakine ..	19,300	160 to 250	£4	142	75 " Northam ..
Dowerin	43,870	100 to 1,000	£3 to £4	120	40 " Northam ..
Dumberning ..	31,147	40 to 687	£3 to £4	180	Adjoins Narrogin ..
Ewlyamartup ..	45,195	Av. about 450	£3	230	2 from Broome Hill ..
Harvey	24,537	Av. about 120	£6	75	40 " Bunbury ..
Jaandkot ..	36,000	About 120	£10	12	10 " Fremantle ..
Katanning ..	50,617	60 to 250	£3 to £4	225	1 " Katanning ..
Koojan	9,725	160	£4	57	50 " Guildford ..
Meckering ..	39,100	100 to 180	£4	89	20 " Northam ..
Mokine	3,100	101 to 198	£4	55	25 " York .. ..
Moorumbine ..	38,342	200 to 530	£3 to £4	118	20 " Beverley ..
Mullewa	12,000	160	£3	364	65 " Geraldton ..
Myrup	6,600	91 to 164	£3	600	9 " Esperance ..
Narrogin .. .	12,185	68 to 650	£4	162	2 " Narrogin ..
Nonga	11,311	96 to 394	£4	346	5 " Northampton ..
Preston	51,545	160 to 600	£6	135	25 " Bunbury ..
Serpentine ..	15,200	120 to 368	£5	34	24 " Pinjarra ..
Tammin	24,000	100 to 654	£4	117	51 " Northam ..
Tanjanerup ..	7,200	100 to 160	£6	176	18 " Bridgetown ..
Tenterden ..	30,000	100 to 368	£4	291	50 " Albany .
Torbay	6,800	192 to 550	£4	335	14 " Albany ..
Tweed	19,685	100 to 250	£6	175	10 " Bridgetown ..
Uduc . ..	12,000	119 to 214	£6	80	5 " Cookernup ..
Wagin	26,000	120 to 270	£3	192	1 " Wagin Lake ..
Wickepin ..	68,852	200 to 1,350	£3	163	10 " Cuballing ..
Yilgarn	15,000	101 to 229	£3	235	1 " Southern Cross

* Date on which

Digitized by Google

as on 31st December, 1901.

Railway.	Quality of Land, etc.	Opened for Selection.
Geraldton to Northampton	Suitable for cereals and fruit	2nd April, 1894.
Yilgarn	Rich loamy soil. Heavily timbered. No surface water—plenty by sinking	20th March, 1895.
Great Southern ..	Good for cereals, fruit, and mixed farming ..	11th September, 1893.
Geraldton to Northampton	Good for cereals, fruit, and mixed farming ..	2nd December, 1901.
Bunbury and Donnybrook	Well adapted for cereal, fruit, and vegetable growing, and dairying	1st June, 1892.
Eastern	Well adapted for growth of cereals	7th December, 1892.
South-Western ..	Exceedingly fertile and extensively watered ..	8th February, 1892.
Do. ..	Suitable for fruit, vegetables, and cereals. Rainfall heavy and regular	4th September. 1893.
Midland Railway ..	Good soil, suitable for cereals and fruit ..	20th March, 1895.
Nil	Cereals, grazing, and fruit	17th February, 1897.
Great Southern ..	Well adapted for fruit and cereals. Splendid rainfall	2nd April, 1894.
Yilgarn	Soil light, sandy loam. Timbered with jam, gimlet wood, and mallee scrub. Rainfall, 13 inches	6th December, 1894.
Do.	Cereals (timbered with salmon gum, gimlet, and morrell)	29th July, 1897*
Great Southern ..	Cereals and fruit	2nd June, 1897.*
Do.	Good, and suitable for corn growing	27th March, 1893.
South-Western ..	Suitable for growing vegetables, fruit, and cereals	3rd January, 1893.
Do.	Swampy. Suitable for vegetables, especially potatoes, and dairying	1st January, 1890.
Great Southern ..	Very good. Cereals and fruit	1st February, 1892.
Midland Railway ..	Good soil, suitable for cereals and fruit	1st November, 1894.
Yilgarn	Excellent for cereals, vegetables, and fruit. Water obtainable at about 20 feet. Admirably situated to supply wants of Yilgarn Goldfield	24th April, 1889.
Eastern	Soil light, sandy loam. Timbered with jam, gimlet wood, and mallee scrub. Rainfall, 13 inches	11th November, 1896.
Great Southern ..	Good for cereals, fruit, and mixed farming ..	10th July, 1893.
Murchison Railway	Stiff clay soil, suitable for cereals and fruit ..	1st August, 1894.
Nil	Cereals, grazing, and fruit	20th May, 1896.
Great Southern ..	Good for cereals, etc.	3rd January, 1893.
Geraldton to Northampton	Clay soil, suitable for cereals and fruit	2nd October, 1893.
Bunbury and Donnybrook	Good alluvial soil, specially adapted for potatoes and other root crops, fruit, dairying, and pig breeding. Heavy rainfall	20th August, 1894.
South-Western ..	Cereal and fruit growing. Heavy rainfall ..	9th April, 1894.
Yilgarn	Rich clay soil. Water scarce. Suitable for cereals and fruit. 14 inches rainfall	17th September, 1894
Donnybrook-Bridgetown	Cereals, grazing, dairying, and specially adapted for fruit	1st May, 1897.
Great Southern ..	Good corn lands, and suitable for fruit growing	1st November, 1892.
Do.	Good corn lands, and suitable for fruit growing	10th December, 1900.
Bunbury and Donnybrook	Splendid alluvial soil. Heavy rainfall. This area contains some of the finest agricultural and fruit growing land in the State	8th March, 1893.
South-Western ..	Rich soil, water plentiful. Suitable for growth of vegetables, fruit, and cereals	1st August, 1894.
Great Southern ..	Fair. Some good. Cereals	1st November, 1892.
Do. ..	Excellent for cereals and fruit	13th March, 1893.
Yilgarn	Grazing. Good soil. Very light rainfall ..	16th October, 1899.

boundaries were defined.

Digitized by Google

Vines and Fruit Trees.

It is now generally conceded that the area of country in Western Australia capable of producing the fruits and vegetables of the temperate and semi-tropic zones has, up to a recent period, been very much under-estimated, and while there are large tracts of sandy waterless wastes in the interior, yet, even in that section, fertile oases are occasionally found where the vine, the fruit tree, and most sorts of vegetables will grow and yield abundantly.

The fruit, wine, and vegetable-producing districts of the State extend from the Murchison River, in the North, to King George Sound, in the South, with an average breadth of about 50 miles, extending from the coast inland at the former locality to 150 miles in the South-Western District.

The variety of soils found and the climatic conditions experienced in this large area render it possible to grow profitably in some portion or other of it, all the different varieties of table, raisin, and wine grapes, together with the orange, lemon, lime, mandarin, apple, peach, apricot, plum, pear, and all the other kinds of citrus and deciduous fruits and vegetables of Central and Southern Europe.

There is, however, this to be said: while all the products enumerated can be grown within the limits mentioned, the soil generally is "patchy," and not of a uniform character. The tracts capable of producing fruit, etc., are limited in extent to the following:—Alluvial valleys along the rivers, the swamp lands, most of which can be easily drained, and, when thus re-claimed, may be converted into orchards or gardens; the valleys among the hills where the water is near the surface; the slopes of the ranges, where the ironstone gravel is considered, when mixed with a fair proportion of loam, the soil best suited to the production of high-class wines; the gullies, river-beds, and other places where there are rich deposits of loam, in which vines and fruit trees thrive luxuriantly; the gullies along the brooks and around the springs, as well as on the low alluvial soil, where the flooded gum, often associated with grass trees or "blackboys," marks out fertile strips of land; the chocolate soil—locally known as the "jam" or "wattle" country—which is considered, on the whole, one of the best balanced in the elements of plant food in the State; and finally, occasional rich patches of volcanic origin and of great fertility. In spots all over the country salt patches are to be found, and these generally appear after the clearing of the land. Their occurrence is more noticeable in what would have been otherwise the most fertile parts of the field, in hollows, or at the base of sloping ground where, owing to the leaching process, these salts accumulate.

Wherever springs of fresh water are found, they transform the naturally dry country, and under the sunny skies, trees and vines bear enormous crops.

It is difficult to estimate the proportion or percentage of barren

Digitized by Google

soils throughout the section under review. It must, however, be admitted that there are large areas where the soil varies from a coloured sandy loam to a pure white sand. This description of country supports shrubs of different sorts, banksias, and, in places where the sand is not too deep, either white or red gums, interspersed with blackboys, and, near the coast, the willow, myrtle, or peppermint tree. It might be considered hopeless to expect the large areas of sand that are found in many parts of the State to give any adequate return for the labour attached to working them, but such is not the case. With the exception of the pure white sand that is found along the coast, all the other sands are found to be fairly fertile, and many kinds of fruit trees planted in them thrive and bear remarkably heavy crops. Those found to be most successful on the sandy soils are peaches, figs, certain varieties of apples and pears, mulberries, and vines ; the latter, in many instances, bearing remarkably heavy crops. All that is required with almost any of our sandy soils to make them prolific is the addition of some phosphatic manure. It has been found that fruit trees will frequently live and bear fairly well when planted in the sand in the drier districts of the State, when they will not live in the heavier soils. In the Geraldton District, along the Chapman River, it has been found that all kinds of citrus trees do remarkably well. In one orchard of oranges and mandarins the trees started to bear heavily when three years old ; when four years old the mandarin trees were found to yield on the average about 36 dozen mandarins, as a consequence of which, within the past year or two, a number of orange groves have been started in the above district.

In the well-sheltered little valleys, from 10 to 30 miles East of Geraldton, there are several fine orchards and gardens. At New Norcia the Benedictine monks have splendid orchards, vineyards, and vegetable gardens, where for many years they have grown sufficient fruit and vegetables, besides making enough wine, to supply the wants of their community.

Large areas of salmon gum and gimlet wood extend, in the neighbourhood of Carnamah, for some distance along the Midland Railway line.

At Bindoon there are several fine orchards and gardens. Gingin is noted for its oranges, and there are there to be found a number of trees over 50 years of age still bearing large crops of fruit ; along the brook are many fine orange groves, and thousands of citrus and deciduous fruit trees have been planted in the district within the last five years. On the banks of the river Swan also there are many orchards and vineyards. At Gooseberry Hill and throughout the Darling Range, in its sheltered valleys and on its sunny slopes, there are now to be seen acres of vines and fruit trees.

Along the Avon Valley, in the vicinity of Beverley, York, Northam, and Newcastle, there are thousands of acres which might

easily be converted, with the aid of irrigation, into profitable orchards and vineyards. At Beverley there were, according to the return taken during February, 1902, 141 acres in vines and fruit trees; at York, 223 acres; at Northam, 444 acres; and at Newcastle, 715 acres. At Katanning, on the Great Southern Railway, apples have been picked weighing over a pound each. At Mount Barker and near Albany there are a number of orchards, vineyards, and garden areas.

Starting from Perth, and going South towards Bunbury along the Western slopes of the Darling Range, and thence through the Blackwood and Sussex districts, there are some of the finest fruit and garden lands in the State. All the fruits of the temperate zone grow to perfection, especially apples, which for colour, size, and flavour are not excelled in any part of Australia. Pears do equally well, whilst small fruits and berries of all sorts thrive and yield good crops. Citrus trees find the climate rather too cold to thrive profitably South of Bunbury. There are also many orchards of fine orange and lemon trees at the Canning, in the Darling Range, at Armadale, Woongong, on the Harvey River, and various other points along the South-Western Railway line.

Wines of the claret and light Burgundy types can be produced even South of Bunbury; but the climate there is hardly warm and dry enough for the successful cultivation of the Muscat family of grapes for raisins; indeed, in the latitude of Albany, grapes do not ripen well, and their extensive cultivation in that section is not recommended.

Western Australia, with the advantages it possesses in the way of soil, climate, and rainfall, and from the fact that her ports are the first and last points of call on the Australian continent for vessels on their way to and from Europe, should, in the near future, be able to produce fruit, not only sufficient to supply the needs of the State, but also a surplus for export to the United Kingdom or elsewhere.

Prior to 1897 all statistical information regarding production was made out according to magisterial districts; but under "The Industrial Statistics Act, 1897," the Registrar General is now required to tabulate the returns "according to the several electoral districts." Consequently the tables have since been arranged as prescribed by the Act, and in some instances it is almost impossible to show the increase as affecting the districts during the past decade. Taking the State as a whole, however, the areas planted with vines and fruit trees show a handsome annual increase.

In 1889 there were 892 acres under vines, and 1,826 acres of orchards and gardens in the State; at the end of the season 1898 the acreages under vines and orchards were respectively 2,960⅝ acres and 3,677½ acres, and in 1901–2 the figures were 3,629 acres and 6,076 acres. But as these latter figures have been compiled on the basis of the actual number of vines and trees planted, according to

Digitized by Google

a standard supplied by the Department of Agriculture, which allows 600 vines or 100 fruit trees to the acre, a comparison between the figures for the years since 1896 and those of previous years would probably be only misleading.

Acreage under Vines, 1900 and 1901.

	Wine Grapes.		Table Grapes.		Total.		Grand Total.
	Productive.	Not bearing.	Productive.	Not Bearing.	Wine Grapes.	Table Grapes.	
	acres.	acres.	acres.	acres.	acres.	acres.	acres.
1900 ..	1,469·2	322·6	888	645·2	1,791·8	1,533·2	3,325
1901 ..	1,709·8	288	1,057·4	573·[illegible]	1,997·8	1,631·1	3,628·9
Increase ..	240·6	- 34·6	169·4	- 71·5	206·0	97·9	303·9

It will be seen by the above table that 303·9 acres were added to the acreage under vines during the year 1901; that there was an increase of 206 and 97·9 acres respectively of wine and table grapes over the previous year; and that there were increases of 240·6 acres of productive wine grapes and 169·4 acres of productive table grapes during the twelve months.

The Swan district contains the largest area under vines, namely, 1,087·6 acres. Toodyay comes second with 501·8 acres; then follow Wellington, 272 acres; Northam, 266·6 acres; Guildford, 207 acres; Murray, 191·6 acres; Moore, 186·1 acres; Williams, 162·26 acres.

The following table gives the number of bearing and newly planted (non-bearing) fruit trees in the State for the years 1900 and 1901:—

Fruits.	1900.		1901.		Increases.		Total Increase.
	Productive.	Not Bearing.	Productive.	Not Bearing.	Productive.	Not Bearing.	
	acres.	acres.	acres.	acres.	acres.	acres.	acres.
Orange ..	214·4	414·4	291·2	367·7	76·8	- 46·7	30·1
Lemon ..	81·9	147·1	103·3	113·4	21·4	- 33·7	- 12·3
Apple ..	727·9	1,399·1	1,002·7	1,675·5	274·8	276·4	551·2
Pear ..	107·7	264·9	120·1	314·0	12·4	49·1	61·5
Quince ..	67·9	53·8	74·5	49·0	6·6	- 4·8	1·8
Apricot ..	143·9	113·7	159·0	112·8	15·1	- ·9	14·2
Peach ..	265·8	230·4	298·4	269·8	32·6	39·4	72·0
Plum ..	116·2	137·7	127·5	144·8	11·3	7·1	18·4
Nectarine ..	48·6	45·4	58·4	48·5	9·8	3·1	12·9
Cherry ..	12·6	33·0	12·6	33·4	..	·4	·4
Fig ..	204·9	136·0	224·6	153·2	19·7	17·2	36·9
Almond ..	45·8	57·3	46·3	59·9	·5	2·6	3·1
Loquat ..	14·3	15·4	16·7	18·4	2·4	3·0	5·4
Mulberry ..	21·6	12·5	22·3	11·6	·7	- ·9	- ·2
Olive ..	16·1	7·6	16·4	5·2	·3	- 2·4	- 2·1
Bananas and Plantains ..	42·5	42·0	21·6	52·4	- 20·9	10·4	- 10·5
Other Fruits ..	27·7	26·2	32·6	18·1	4·9	- 8·1	- 3·2
Total ..	2,159·8	3,136·5	2,628·2	3,447·7	468·4	311·2	779·6

Digitized by Google

From the above it can be seen that the total acreage under fruit trees in Western Australia, at the close of the year 1901, amounted to 2,628·2 acres of productive trees and 3,447·7 acres of young trees which had not begun to give any return to the grower, making a grand total of 6,075·9 acres. It is satisfactory to observe that during the twelve months 468·4 acres came into bearing; that there was an increase of 311·2 acres of non-bearing trees over the previous year, and that 779·6 acres of fruit trees of various kinds were planted. Apples head the list with an increase of 551.2 acres, making a total of 2,678.2 acres devoted to that fruit, of which 1,002.7 acres were in bearing, an increase of 274.8 acres in this respect over the previous year. Peaches come next with an increase of 72 acres planted during the year, the total acreage under fruit being 568·2 acres, of which 298.4 acres were productive trees, an increase of 32·6 acres over the year 1900. The other fruit trees most in favour are the orange, apricot, pear, fig, plum, etc.

Fruit appears to be grown in almost every district of the State. There were, at the beginning of 1902, 868·5 acres in the Swan district, or an increase of 39·3 acres over the preceding year; 567·5 acres in the Murray district, or 69·6 acres more than in the previous year; 681·6 acres in the Nelson district, an increase of 157 acres; 690·2 acres in the Plantagenet and Albany districts, an increase of 153·7 acres; 425·3 acres in the Williams district, an increase of 81·5 acres; 177·2 acres in the Northam district, a decrease of 25·6 acres; 212·9 acres in the Toodyay district, an increase of 25·5 acres; 471·7 acres in the Wellington district, an increase of 80·5 acres.

The following table gives the values of imports for the years 1892–1901 of certain fruit and vegetable products that might be produced in the State:—

Articles.	1892.	1893.	1894.	1895.	1896.	1897.
	£	£	£	£	£	£
Candied Peel	274	234	266	336	458	519
†Currants	..	..	1,722	1,906	3,483	5,314
Dates	875	308	473	762	1,290	1,719
Fruit—Dried, N.O.E. ..	6,848	5,622	2,750	4,426	6,649	6,091
Green	2,229	2,743	5,431	8,878	13,402	20,037
Bottled & Tinned	3,048	3,097	6,765	14,653	23,914	32,049
Jams, Jellies, and Preserves	11,755	11,977	22,030	27,637	48,131	52,324
Nuts	591	445	934	1,517	2,855	2,885
Plants, Seeds, and Bulbs	3,278	3,529	5,823	4,686	955	6,017
†Raisins	..	..	1,518	2,251	4,032	5,159
Salad Oil	482	303	429	786	860	845
†Vegetables—Fresh * ..	..	..	..	..	850	1,324
Preserved ..	3,220	2,828	8,614	14,987	25,989	18,473
Total value of Imports of Fruit, etc.	32,600	31,086	56,755	82,825	132,868	152,756

* Not including potatoes and onions. † In cases where blanks occur, the article was probably classified under some general heading, and not particularly specified.

Digitized by Google

Value of Imports, etc.—continued.

Articles.	1898.	1899.	1900.	1901.	Totals.
	£	£	£	£	£
Candied Peel	415	244	139	73	2,958
Currants	4,695	5,928	5,061	6,977	35,086
Dates	1,086	1,644	1,695	1,563	11,415
Fruits—Dried, N.O.E ..	2,716	4,631	5,552	3,643	48,928
Green	17,245	16,716	18,386	25,315	130,382
Bottled and Tinned	30,474	25,306	35,389	32,045	206,740
Jams, Jellies, and Preserves	47,026	51,546	48,731	42,932	364,089
Nuts	2,164	2,407	3,814	4,464	22,076
Plants, Seeds, and Bulbs ..	5,623	7,019	6,290	6,728	49,948
Raisins	4,480	6,757	4,582	5,467	34,246
Salad Oil	706	796	1,029	698	6,934
Vegetables—Fresh* ..	555	464	3 6	500	3,999
Preserved ..	15,3 1	10,738	16,381	15,558	132,149
Total value of Imports of Fruit, etc.	132,546	134,196	147,355	145,963	1,048,950

* Not including potatoes and onions.

It will be observed from the above return that there was a falling off in the total values, comparing 1901 with 1900, amounting to £1,392. It seems extraordinary, however, that it should during the decade have been necessary to import products of this nature to the value of a million sterling.

The number of cases of fresh fruit passed by the Inspectors of the Agricultural Department, at the various ports of the State, during 1900 and 1901, is given, with particulars, in the following table :—

	1901.				1900.		
	No. of cases received.	No. diseased.	No. decayed.	Total cases destroyed.	No. of cases received.	Increase.	Decrease.
Apples	14,252	1,080	1,688	2,768	..	14,252	..
Apricots	140	48	40	88	227	..	87
Bananas	13,826	..	1,656	1,656	5,444	8,382	..
Cherries	3,457	..	452	452	2,587	870	..
Gooseberries ..	777	..	120	120	616	161	..
Lemons	9,803	78	497	575	10,490	..	687
Oranges	21,253	604	2,363	2,967	12,285	8,968	..
Passion Fruit ..	1,716	3	48	51	816	900	..
Pears	430	35	41	76	..	430	..
Plums	5,405	..	112	112	3,671	1,734	..
Pines	283	..	34	34	..	283	..
Rhubarb	18	..	..	..	22	..	4
All other	342	..	28	28	414	..	72
Totals ..	71,702	1,848	7,079	8,927	36,572	35,980	850

Although the increase from 36,572 cases to 71,702 cases is enormous, it will be seen, from the return given below, that local fruit-growing, as indicated by the constant importation of large consignments of fruit trees, is nevertheless being vigorously carried on.

Digitized by Google

Return of Fruit Trees and Plants Imported into Western Australia during 1900 and 1901.

	1900.	1901.	Increase.	Decrease.
	No. received.	No. received.		
Apples	55,575	38,808	16,767	..
Almonds	341	6,456	..	6,115
Apricots	1,887	1,839	48	..
Cherries	584	2,638	..	2,054
Figs	489	288	201	..
Lemons	415	1,857	..	1,442
Mulberries	475	420	55	..
Oranges	15,367	13,256	2,111	..
Peaches	10,445	10,065	380	..
Pears	4,014	9,613	..	5,599
Plums	2,839	3,817	..	978
Grape Vines	11,750	7,000	4,750	..
Small Fruits	7,617	13,022	..	5,405
Ornamental Trees and Plants	19,901	18,873	1,028	..
All other Trees	3,960	6,598	..	2,638
Totals	135,659	134,550	25,340	24,231

The great increase, therefore, in the quantities of fresh fruit imported, can only be attributed to a rapidly growing consumption of fruit, due to the prevalence of more reasonable prices.

Under the provisions of "The Insect Pests Act, 1896," power is vested in the Department of Agriculture to recommend the appointment of inspectors, with power to call upon the occupiers of orchards, vineyards, nurseries, or gardens, and notify them to take efficient measures for the eradication of any pest, disease, or disorder with which their fruit trees, vines, or other vegetation are found by the inspectors to be infected. If such occupier then persists in not complying with an order to this effect, issued by the Chief Inspector, the Department may, subject to an appeal to the Resident Magistrate, carry out any measures deemed necessary, without the consent of the occupier, and at his expense.

Orders regulating the Importation and Disinfection of Vine Cuttings, Buds, and Grapes.

1. The importation of rooted grape vines or grape vines that have had their roots removed is absolutely prohibited.

2. All vine cuttings imported shall be absolutely surrendered to the Chief Inspector or Local Inspector at the port of debarkation for the purpose of being quarantined, as hereinafter provided.

3. All vine cuttings imported shall be quarantined by the Department of Agriculture for a period of not less than 12 months, nor longer than two years, upon such grounds as from time to time shall be set apart by the said Department by advertising in the *Govern-*

Digitized by Google

ment Gazette as quarantine stations. The consignee, agent, or other person engaged or concerned in the importation of any such vine cuttings as aforesaid shall, at the time of delivering the same to the Department of Agriculture for the purpose of being quarantined, pay to the Director of Agriculture a sum of 2s. 6d. for every 100 cuttings so delivered, and at the expiration of the period of quarantine shall, upon taking delivery of his rooted vines, pay the further sum of 2s. 6d. for every 100 rooted vines so delivered to him.

4. Any vine cuttings imported which are at the time of landing, in the opinion of the Chief Inspector or Local Inspector, affected with insects, fungi, blight, or other diseases injurious to grape vines or other trees or plants shall be destroyed under the direction of the said Inspector, and the expense connected therewith shall be borne by, and recoverable from, the importer of such vine cuttings.

5. The Department of Agriculture shall not be liable for any loss resulting from the destruction of any cuttings under the provisions of the preceding paragraphs, or by reason of the infertility of any such cuttings while in or after leaving their custody or whilst under their control.

SCHEDULE.

Scale of Fees to be paid for the Inspection and Disinfection of Vine Cuttings and Buds.

	s.	d.
100 or less	2	6
Over 100 and not more than 500	5	0
Over 500 and not more than 1,000	10	0
Over 1,000—for every additional 1,000 or part thereof	2	6

ORDERS REGULATING THE DISINFECTION OF IMPORTED TREES, PLANTS, CUTTINGS (OTHER THAN VINES), GRAFTS, BUDS, SEEDS, PITS, SCIONS, AND FRUITS.

6. All fruit, fruit trees, plants, cuttings, grafts, buds, seeds, pits, or scions imported into the State of Western Australia shall be discharged direct from the ship or lighter into trucks, or as may be ordered by the Director of Agriculture, for immediate removal to the disinfecting sheds, and shall not be discharged upon any wharf, quay, jetty, or premises unless so ordered by the Director of Agriculture.

7. All consignees, agents, or other persons engaged or concerned in the importation into Western Australia of any fruit, fruit trees, plants, cuttings, buds (other than vine cuttings or buds), seeds, pits, or scions shall, within twenty-four (24) hours after the arrival of any such fruit, fruit trees, plants, cuttings, buds, seeds, pits, or scions, at the first port or place of debarkation in the State of Western Australia, deliver the same to the said Chief Inspector or Local Inspector, and unpack and prepare them for disinfection, and in the event of any such consignee or his agent failing to so deliver any such fruit, fruit trees, plants, cuttings, buds, seeds, pits, or scions within twenty-four

(24) hours, as aforesaid, the Chief Inspector or Local Inspector shall seize the same. If, upon such seizure, the said fruit, fruit trees, plants, cuttings, buds, seeds, pits, or scions are found to be infested with any injurious insects (or their germs), or with fungi, blight, or other diseases injurious to fruit or to vines or fruit trees or to other trees or plants, the said Inspector shall immediately destroy the same; but if the said fruit, fruit trees, plants, cuttings, buds, seeds, pits, or scions are found, on inspection, to be free from injurious insects (or their germs), or from fungi, blight, or other diseases injurious to fruit, fruit trees, vines, or other trees or plants, the said Inspector shall treat the said fruit, fruit trees, plants, cuttings, buds, seeds, pits, or scions as may be prescribed by the Director of Agriculture, and hold same until applied for by the consignee or agent. Provided that if the same be not applied for within forty-eight (48) hours from time of seizure the same may be destroyed.

8. All fruit, fruit trees, plants, cuttings, grafts, buds, seeds, pits, or scions imported into the State of Western Australia are hereby required to be disinfected by the Chief Inspector or Local Inspector immediately upon arrival at the port or place where they are to be unloaded. If any of the said fruit, fruit trees, plants, cuttings, grafts, buds, seeds, pits, or scions are found to be infested with insects (or their germs), or with fungi, blight or other diseases injurious to fruit or to fruit trees, or to other trees or plants, they shall remain in quarantine for a period of fourteen (14) days, or until the Chief Inspector or Local Inspector can determine whether the said trees, plants, cuttings, grafts, buds, seeds, pits, or scions are free from injurious insect pests or their eggs, larvæ, or pupæ. After inspection and disinfection the Chief Inspector or Local Inspector shall issue a certificate, after the cases or packing or transportable material in which such fruit was packed have been disinfected, as prescribed by Order 11, and on the receipt of the fee for inspection and disinfection prescribed in Schedules I., II., and III. hereto. After disinfection, consignees or their agents must repack the fruit, fruit trees, vine cuttings, packages, or transportable material that have been disinfected, and remove the same within twenty-four (24) hours.

9. All peach, nectarine, apricot, plum, prune, almond, and all trees budded or grafted upon peach stocks or roots, and all peach or other pits, cuttings, buds, or scions raised or grown in any place where the "peach yellows," or the "peach rosette" are known to exist, are prohibited from being imported into the State of Western Australia.

10. The importation into any port in Western Australia of any fruit, plant, or part thereof, infested with the codlin moth, mussel scale, Queensland fruit fly, phoma, citricarpa, phylloxera, the San Jose or pernicious scale, the mining or chionaspis scale, the wax scale, or with internal parasites, such as the larvæ of the codlin moth, fruit flies, nematodes, or bacterial diseases, with melanose fungus, or with any pests, parasites, or fungi which may, from time to time, be declared

Digitized by Google

as such by the Governor in Council, under Section III. of the Insect Pests Amendment Act, 1898, is absolutely prohibited.

11. Soil or compost in pots, cases, or packages, and transportable material of any kind used for packing or surrounding fruit is hereby prohibited from being removed from the first port or place of debarkation, or from being offered for sale, gift, distribution, or transportation until the said material (unless otherwise directed by the Director of Agriculture) has been disinfected by dipping the same and keeping it continually submerged for a period of not less than five (5) minutes in boiling water containing in solution not less than one pound (1lb.) of concentrated potash to each and every ten (10) gallons of water.

12. Fruit cases containing vegetables or vegetable matter other than fruit imported into the State, are also hereby required to be disinfected, as per Order 11, before removal from the first port or place of debarkation.

13. Any fruit, fruit trees, vine cuttings, packages, or transportable material delivered to the Chief Inspector or Local Inspector for disinfection, and not disinfected within forty-eigth (48) hours by reason of the default of the consignee to provide the necessary labour for unpacking and repacking, may be destroyed by the Chief Inspector or Local Inspector.

Schedule I.

Scale of Fees to be charged for Inspection of Fruit.

	s.	d.
56lbs. or under	2	6
Over 56lbs. and not more than 112lbs.	5	0
Over 112lbs. and not more than 224lbs.	7	6
Over 224lbs. and not more than 336lbs.	10	0
Over 336lbs. for every additional 112lbs. or part thereof	1	0

Schedule II.

Scale of Fees to be paid for the Inspection of Trees, Plants, etc., of all Descriptions other than Vine Cuttings.

	s.	d.
25 or less	1	6
Over 25 and not more than 50	2	6
Over 50 and not more than 100	4	6
Over 100 and not more than 200	6	6
Over 200 and not more than 300	7	9
Over 300 and not more than 400	9	0
Over 400 and not more than 500	10	0
Over 500, for every additional 100 or part thereof	0	9

Schedule III.

Scale of Fees to be charged for the Inspection and Disinfection of Gooseberries, Raspberries, Strawberries, Bulbs not in earth, and other small plants of a like nature, at the discretion of the Director of Agriculture :—

	s.	d.
25 or less	0	9
Over 25 and not more than 50	1	3
Over 50 and not more than 100	2	3
Over 100 and not more than 200	3	3
Over 200 and not more than 300	4	0
Over 300 and not more than 400	4	6
Over 400 and not more than 500	5	0
Over 500, for every additional 100 or part thereof	[illegible]	[illegible]

Digitized by Google

Registration of Orchards, Vineyards, and Nurseries.

14. The owner or occupier or person in charge of any orchard, garden, nursery, vinery, vineyard, or hothouse, or any land used for the purpose of growing or cultivating any plants, shall register the same with the Director of Agriculture at Perth, and at the same time forward for registration fee the sum of 2s. 6d. for an area of one acre or under, and the sum of 5s. for an area exceeding one acre.

15. All packages sent away from any nursery containing fruit trees, vines, or other vegetation intended for sale, distribution, or gift, must be legibly marked with the name and address of the consignor and consignee, and a descriptive invoice of the contents must accompany same, together with a certificate to the effect that such contents have been disinfected, as may be prescribed from time to time by the Director of Agriculture, and are free from insects, fungi, blight, and all other diseases attacking fruit, fruit trees, and other vegetation.

16. Any vendor of fruit, grower, dealer, or auctioneer who shall sell, or attempt to sell, or offer or expose for sale, any fruit, fruit trees, plants, or other vegetation affected with the codlin moth, mussel scale, Queensland fruit fly, the phoma, citricarpa, phylloxera, the San Jose or pernicious scale, the mining or chionaspis scale, the wax scale, or with internal parasites, such as the larvæ of the codlin moth, fruit flies, or nematodes, or bacterial diseases, or melanose fungus, or with any other diseases which may, from time to time, be declared as such by the Governor in Council, shall be liable, on conviction, to a penalty not exceeding One hundred pounds (£100); and any Inspector or other authorised person shall seize and destroy such infected fruit, and the cost of such seizure and destruction shall be at the expense of and recoverable from the person selling or offering the said fruit for sale, gift, or distribution.

17. No compensation will be paid for any fruit, fruit trees, plants, cuttings, buds, seeds, pits, scions, cases, packages, or transportable material destroyed under these Regulations.

18. The use within the State of second-hand fruit cases, or cases or packages that may reasonably be supposed to have contained fruit, is prohibited, and the Chief Inspector or Local Inspector may order the disinfection of same, as provided in Order 11, or by any other means that may be prescribed by the Director of the Department of Agriculture, and failing such disinfection shall seize and destroy same.

19. The foregoing orders do not apply to any port or part of the State of Western Australia North of the 26th parallel of South latitude.

20. The importation into the State of Western Australia South of the 26th parallel of South latitude of fruit, fruit trees, plants,

Digitized by Google

cuttings, grafts, buds, seeds, pits, or scions is prohibited except through the ports of Albany, Fremantle, Geraldton, and Esperance.

21. These Regulations came into force on the 1st day of August, 1902, and superseded those gazetted 6th July, 1901.

The ports of Albany, Esperance, Fremantle, and Geraldton have been appointed by the Agricultural Department to be quarantine grounds where plants and fruit, and the packages containing the same, or with which the same may have come in contact, may be detained for the purpose of being inspected, disinfected, destroyed, or otherwise disposed of.

Species of Fruit grown in the State.

A great variety of fruits are grown in the State, and in some districts in considerable quantities. The following is a list of some of the principal species of fruit grown in Western Australia, and the seasons when they are ripe :—

Local Name.	Scientific Name.	When Ripe.
Grape	Vitis Vinifera	December to April
Apple	Pyrus Malus	January to July
Orange	Citrus Aurantium	June to October
Lemon	Citrus Limonum	Do.
Pear	Pyrus Communis	December to August
Fig	Ficus Carica	December to March
Peach and Nectarine	Amygdalum Persica	December to May
Apricot	Prunus Armeniaca	December to February
Cape Gooseberry	Thysalis Edulis	All the year
Plum	Prunus Domestica	January to March
Loquat	Mespilus Japonica	September to October
Banana	Musa Sapientum	January to July
Plantain	M. Paradisiaca	Do.
Quince	Pyrus Cydonia	February to March
Strawberry	Fragaria	October to June
Melon (Water)	Cucumis Citrullus	January to March
Melon (Rock)	Cucumis Melo	Do.
Mulberry	Morus Nigra	Do.
Pomegranate	Punica Granatum	February to March
Gooseberry	Ribes Grossularia	January
Currants	Ribes Nigrum	Do.
Cherries	Cerasus Avium	Do.
Almond	Amygdalus	February
Medlar	Mespilus Germanica	Do.
Guava	Psidium	Do.
Olive	Olea Europoea	June and July
Raspberry	Ribes Neglectus	December
Blackberry	Ribes Villosus	Do.
Date	Phœnix Dactylifera	February to May
Walnut	Juglans Regia	March
Chestnut	Castanea Sativa	Do.
Persimmon	Diospyros Kaki	February to April
Passion Fruit	Passiflora Edulis	December to March
Tomato	Lycopersicum Esculentum	December to May
Kumquat	Citrus Japonica	May
Pomelo	Citrus Clecumana	May to July
Mandarin	Citrus Nobilis	Do.

Digitized by Google

Most of the fruits mentioned in the above list are capable of extensive production, particularly grapes and oranges; also apples, pears, peaches, plums, apricots, nectarines, etc.; whilst many others could be cultivated in those portions of the State which may be found suitable to their growth.

Experimental Farms.

In order to aid the farmers as much as possible in the matter of testing the value of new kinds of plants, and to facilitate the free distribution of new varieties of seeds, the Government for some years past have maintained a small Experimental Farm at Hamel, on the South-Western Railway line. For the use of this farm seeds of all kinds are obtained and experimented with, when those that are found to be of economic value are distributed amongst the settlers in various parts of the State. This scheme has proved of much value to the farmers, but owing to the limited extent of land available at the farm, the quantity of seed grown is but small, and insufficient to supply any demand except in quantities of a few pounds. This difficulty has been recognised by the Government, as also has the necessity for carrying out similar experiments in other and drier parts of the State, and under different conditions. With this object in view, two new experimental farms have been recently established on a greatly extended basis—one at Narrogin, situated on the Great Southern Railway, consisting of about 1,000 acres, and another, of about 700 acres, on the Chapman Agricultural Area, to the North of Geraldton. At these farms various kinds of cereals will be thoroughly tested, and those that suit the district best will be decided on, and seed in quantities supplied to any farmer who may want it. Stud stock will also be kept and bred, and the young stock will be sold annually. Already a start has been made in that direction, and the stock now consists of Ayrshire and Dexter Kerry cattle, Clydesdale horses, Shropshire sheep, Angora goats, and various kinds of poultry, including American bronze turkeys. Arrangements have been made for students who wish to learn practical farming being received on easy terms, and for sound instruction being given to them in all kinds of farm work, both in practice and theory, including the use of the various implements employed on the farm.

Cultivation and Crop Returns for the Year ended 28th February, 1903.

	Acreage under.	Yield.	Average yield per acre.
		Bushels.	Bushels.
Wheat	92,398	985,559	10·67
Oats	10,334	167,882	16·25
Barley	3,783	46,255	12·23
Maize	109	2,110	19·36
Dry Beans	26	382	14·69

Digitized by Google

CULTIVATION AND CROP RETURNS, ETC.—*continued.*

	Acreage under.	Yield.	Average yield per acre.
		Bushels.	Bushels.
Dry Peas	379	5,175	13·65
Rye	463	4,419	9·54
		tons.	tons.
Potatoes	2,084	6,488	3·11
Onions	88	237	2·69
All other Root Crops	130	674	5·18
Hay of all kinds	105,791	94,007	0·89
Green Forage	636	..	..
		wine, gals.	
Vines { Productive	2,844	158,853	..
Vines { Unproductive	684	..	..
Orchards	6,872	..	..
Market Gardens	2,262	..	..
Kitchen Gardens	837	..	..
All other Crops	272	..	..
Total Land under Crop	229,992	..	..
Land in fallow	70,725	..	..
Area under Permanent Artificially Sown Grasses	11,529	..	..
Total Area in Cultivation	312,246	..	..

POSSIBILITIES OF TROPICAL AGRICULTURE IN THE NOR'-WEST.

THE BEAGLE BAY MISSION EXPERIMENTS.

By Daisy M. Bates.

In 1897, Mr. R. Helms, who, at that time, was Biologist to the Department of Agriculture, made a visit to East Kimberley, and, in an extensive report, gave a most graphic account of the possibilities of tropical cultivation.

In order to furnish a true report of the prospects and work of the Trappist Mission at Beagle Bay, in September, 1900, by the kindly invitation of Bishop Gibney, I accompanied him and the Very Rev. L. M. Martelli to the Mission, which is situated some 1,600 miles due North of Perth. The Mission having been started about ten years ago, it may be of interest to the advocates of tropical agriculture to be made aware of the results of the missionaries' labours in the growth of fruits, cereals, etc.

About 75 acres of land surrounding the Mission had been cleared for cultivation, and upon this land the experiments were carried out, and with what success will be seen below.

Seeds and plants were obtained from Europe, Singapore, and the Agricultural Department of this State. These were carefully planted, and the results are highly satisfactory.

Digitized by Google

Bananas, as being the most successful of all the fruits grown, claim first attention. I counted upwards of 8,000 plants and shoots, all the grown plants fruit-bearing. The Abbot informed me that he had 13 varieties of this plant, all in the highest state of excellence, some of the plants being upwards of 15 feet in height. I tasted many of these bananas, the delicate and luscious flavour of most of them being perfectly delicious. The gardens in which they are grown are marked out in spaces about 15 feet apart, and trenched between every two rows. As there are numerous springs in the gardens, a constant stream of water flows through the trenches. In the earlier stages of their growth, vegetables are sown between the rows, but as soon as the plants begin to bear fruit, the space between is left clear.

The trees are very prolific; on one bunch alone Father Martelli counted 150 bananas, and that number, I was told, was by no means unusual. Altogether, banana culture is one of the chief successes at the Mission.

Fifty-two cocoanut trees had been planted, but as these trees take from eight to ten years to attain maturity, only three were fruit bearing. I had the pleasure of opening the first cocoanut grown at the Mission, and found it an excellent specimen of what promises to eventually become a very lucrative industry. I do not myself think there is sufficient space left between the cocoanut trees, and this may, as they grow up, materially affect the fruit-bearing capacity of some of those planted about six years ago, but at present all the trees are healthy and look most promising.

The date trees, 60 in number, were planted about the same time as the cocoanuts, and as they also take eight or nine years to come to maturity, seven only were then fruit-bearing. I believe that date trees should be planted in groups, as the male and female flowers are developed on separate trees. The date fruit had not come to maturity during my stay at the Mission, though it looked strong and healthy, so I was then doubtful whether it would ever arrive at full fruition, as in the case of a male tree not being present, the female would not be fertilised, and the fruit consequently would not mature, but would drop off without getting thoroughly ripe. I have since heard, however, from the present Superior, that the fruit had duly ripened, and was of excellent flavour.

Pineapples were growing successfully, and many of them were ripening at the time of our departure from Beagle Bay.

Of fig trees there were not many growing—about 20—but all were carrying fruit; and there were six young orange trees doing very well.

The castor-oil plant grows abundantly, and Father Martelli, who spent many years in India, states that the seeds obtained at the Mission are equal to the Indian product, so that this oil may some day become an important article of commerce.

The pomegranate trees were flourishing, also the papaw, the fruit of which is most delicious. When green, this fruit can be used

Digitized by Google

as a vegetable for soups, etc.; it is then not unlike the marrow in flavour.

Rock and water-melons grow in abundance; the Cape gooseberry thrives wonderfully well; sugar-cane and sorghum are also grown, and are highly successful. A very pleasant drink, which I called "Beagle Bay Beer," is made from the cane, sugar and water being the only other ingredients, making a good thirst-quenching beverage. The sorghum is principally used for horses and poultry feed, but in future it may possibly be grown in sufficient quantity to take the place of rice at times as a food for the natives, the absence of proper machinery for crushing, etc., alone preventing its being more extensively cultivated.

Rice has been sown in the swamp lands, and, when practical men take its cultivation in hand, will go far towards making the Mission self-supporting, as the food of the natives consists mainly of rice and pumpkins.

The specimens of arrowroot which I brought with me from Beagle Bay were pronounced by a Queensland expert to be better than the best grown in that State. The need of machinery for its manufacture is the only reason why it is not more extensively planted, it having been satisfactorily proved that the soil is eminently suited for the growth of this plant.

Tobacco-growing on a more extensive scale than obtains at present will also be undertaken as soon as an expert in its growth and curing arrives from Europe. At present it is grown in small quantities, but has not been manufactured into the finished article, owing, I understand, to the fact that rum is required in some stages of its manufacture, and there were no means of making rum at the Mission.

As regards vegetables, Beagle Bay might be called a Chinaman's paradise. Firstly, I must take the English potatoes, which are as good as any I have eaten in England or Ireland—large, well-developed, fine "floury" potatoes, which will easily find a market in the various towns along the coast, where now, at most of the hotels in the Nor'-West, you are given a Singapore product, misnamed potato, about the size of a marble, waxy and unpalatable.

Large sweet potatoes, "taro" (an excellent kind of vegetable, somewhat resembling the potato, and growing in the garden trenches), pumpkins, cabbages, lettuce, tomatoes, chillies, cucumbers, onions, eschalots, peas, beans (one long variety measuring about a yard in length, not the seven years' bean, I am told, but another), radishes, carrots, and parsnips—all these grow abundantly, and are the best of their kind. Many of the pearling boats come regularly into Beagle Bay in order to obtain a supply of these vegetables.

The district is well timbered, cajeput being the principal variety. This tree resists to a greater extent than any other (not excepting jarrah) the ravages of the white ant, and has been extensively used in the Monastery buildings. Eucalyptus, acacia, banksia, paper bark

Digitized by Google

ti-tree, and a tree the natives call "kurra-burra," which has large seed-pods, the seeds rivalling almonds in flavour—all these trees grow in the district. Occasionally, but not often, a "willy-willy" visits the Mission; but the country being so well and thickly timbered, the storms usually experienced are neither frequent nor destructive.

At Disaster Bay the monks have planted some bamboos of an Indian species; those I saw growing were from 12 to 15 feet in height.

Some seeds of the *Kicksia Africana*, a species of rubber tree, were sent to the Mission, for experimental purposes, by the Agricultural Department, but I did not hear of their having been planted, nor of their ever having been received. They may have been los in transit, or they may have been received just at the time some of the monks were leaving for Europe, when those who filled their places probably overlooked the packet. An experiment with any species of *Ficus elasticus* is, however, well worth trying, in view of the fact that, owing to the reckless destruction of rubber-producing trees in their native homes, rubber is yearly becoming more scarce and valuable, at a time when an unprecedented use is being made of it for the wheel tyres of bicycles, motor cars, carriages, etc.

There are about a thousand head of cattle on the Mission run, and I noticed that those occupying the marsh lands were fatter and much better looking than the herd that keep to the "pindan," or bush lying between Beagle Bay and Disaster Bay, within the Mission reserve. The working bullocks would take a prize at any show in the States.

The country does not seem at all suitable for sheep, all those on the Mission land being very poor and weedy, and not averaging above 30lbs. in weight, and with very scanty wool. As there is plenty of food and water, it must follow that either the quality of the grass is unsuitable for sheep, or the conditions of the climate do not admit of sheep thriving in these parts.

Horses do not seem to fare well either, as many losses have been sustained owing to the prevalence of a poison plant, which causes much mortality among them. The monks have now planted several acres of couch grass for horse paddocks, and by this means, it is to be hoped, mitigated the risk. I have been told that the first and succeeding generations of horses born on the place successfully resist the poisonous grasses, and become hardy and strong. Timor ponies seem to thrive best.

A species of wild bee, stingless, and somewhat smaller than the house fly, builds its nest in the piped branches of the white gum, and collects a most delicious honey, which has a very curious and attractive flavour, but is totally unlike any other wild honey that I have ever eaten. It is very difficult to find the nests of these little insects, the opening being so small. The manner in which the natives discover them is by looking on the ground underneath the tree for any dead

Digitized by Google

bees that may have fallen out of the nest, and as the bees are very very small, the native has to kneel down and look closely among the grass and dead leaves until he finds what he is seeking, when the branch containing the nest is cut down, and the honey, bees, and wax eaten *holus bolus.*

One of the greatest blessings in and around Beagle Bay is the abundance of the water supply. There are no watercourses, but numerous springs are to be found. Between the two bays, Beagle and Disaster, the country is almost level, only dotted here and there with curious little mounds covered with screw-palms and acacia. These mounds are really springs, where the water, having forced its way from some subterranean source, has ultimately found an outlet. I did not find any of these springs further than fifteen miles inland from the coast. Many of the springs have been opened out, and troughs fixed around them for the use of the stock. The water in them is constantly in motion, and always keeps a certain level, so, naturally, when the troughs are placed in a position slightly below the level of the wells, the water flows into them, and they are always kept filled by the overflow from the well. In this way the water in the trenches is kept continually in motion, and the banana and other gardens are "supplied with fresh water daily." There are, I may mention, including the "banana nursery," four gardens attached to the Monastery.

It will be seen from the above account of the productive qualities of Beagle Bay what facilities and inducements there are for enterprising settlers to try their fortune in that part of the Nor'-West. That the climate is trying, I admit; still, it is livable. I was up there during some of the worst months—August to the end of November—and in the latter part of my stay the thermometer at times registered 110° Fah. in the shade; hot winds also occasionally aggravated the heat, whilst on some days again there was not a breath of wind. In spite of these temporary inconveniences, however, I was always able to endure the heat, and pursue my daily work.

2.—PASTORAL.

(By Alex. Crawford, Acting Director of Agriculture.)

The opportunities offering in connection with the pastoral industry in Western Australia are very considerable, as up to the present time comparatively little has been done towards its development as one of the principal of the numerous and vast resources of the State. A large extent of grazing land has been taken up in the Kimberley, Ashburton, Gascoyne, Esperance, and Eucla districts but as yet the holdings are invariably understocked. This latter

Digitized by Google

remark more particularly applies to the Kimberley division, from whence the principal local cattle supplies are at present chiefly drawn; and until more breeding cattle are introduced, with a view to adjusting the quantity of stock to the carrying capacity of the country, so long will these districts, with their immense possibilities, remain in an undeveloped state. The greater portion of the Kimberley country consists of strong, highly productive soils, and the heavy tropical rains, combined with the warm climatic conditions, induce a most abundant growth of pasture. Through being under-stocked, and consequently not held in check, these grasses eventually become coarse and unfit for cattle; but if the Kimberley country carried its full capacity of stock, a sweeter and more succulent growth of pasture would naturally obtain, and the industry generally would be materially benefited. The cattle industry is rapidly advancing in importance, but there is still ample scope for the further investment of capital. This is clearly demonstrated by the fact that in the year 1901 nearly £200,000 was paid away to the Eastern States to supplement the local meat supply. In the following table the figures relating to animals imported for slaughter speak for themselves:—

		Value. £
Cattle	11,984 ..	124,458
Sheep	70,099 ..	67,236
Pigs	2,145 ..	3,922
	Total ..	195,616

An effort is now being made by Kimberley cattle-breeders to secure a greater portion of the local trade, but the prices offering for marketable beef up to the present have been so tempting that anything, whether suitable for slaughter or not, has hitherto gone to the knife, and thus, unfortunately, the increased stocking of the runs, which is so urgently just now required, has been prevented.

The local demand for live stock of all descriptions being so strong, there is, as would be expected, practically no export trade, but the appended tabulated statement indicates what little does exist in this connection:—

Return showing the Number and Value of Exports of certain Live Stock, 1892–1901.

Year.	Horses.		Horned Cattle.		Sheep.		Pigs.		Camels.	
	No.	£	No.	£	No.	£	No.	£	No.	£
1892 ..	245	2,450	33	178	300	160	..	..	..	..
1893 ..	74	780	26	125	1,551	536	2	5	..	..
1894 ..	5	285	..	..	1,300	520	..	..	..	..
1895 ..	22	958	..	..	..	..	..	..	1	50
1896 ..	36	360	..	..	1,004	364	..	..	..	..
1897 ..	90	2,047	..	..	1,794	1,188	..	..	200	6,000
1898 ..	74	1,947	172	1,102	300	105	3	26	502	15,060
1899 ..	47	3,012	216	1,239	1,133	470	15	14	3	105
1900 ..	443	9,907	3	18	1,628	1,039	25	29	189	3,780
1901 ..	508	10,025	1	10	3,028	1,954	7	7	..	..

Digitized by Google

The country most suitable for sheep lies South-West of the Kimberley District. and extends, following the contour of the coastline to the South-Eastern extremity, over all that portion of the country where the food and water supply is sufficient for the purpose required. Yet over this vast stretch of territory there were in 1901 only 2,625,855 head of sheep, the returns, however, showing a progressive movement when compared with the statistics of previous years. But a better comparison can be made from the following figures :—

Return showing Number of Live Stock in the State from 1892 to 1901.

Year.	Horses.	Cattle.	Sheep.	Pigs.	Camels.
1892 ..	44,973	162,886	1,685,500	24,417	595
1893 ..	45,747	173,747	2,220,642	26,233	673
1894 ..	50,001	187,214	2,132,311	28,396	2,347
1895 ..	58,506	200,091	2,295,832	27,015	3,456
1896 ..	57,527	199,793	2,248,976	31,154	3,984
1897 ..	62,222	244,971	2,210,742	31,809	3,072
1898 ..	63,604	269,947	2,251,548	39,433	3,197
1899 ..	65,920	297,075	2,282,306	55,953	2,571
1900 ..	68,253	338,590	2,434,311	61,740	3,246
1901 ..	73,710	398,547	2,625,855	61,052	1,396

It will be seen that during the decade, 1892–1901, there was an increase in horses, cattle, sheep, and pigs, respectively, of 28,737, 235,661, 940,355, and 36,635.

The distribution of Live Stock within the Electoral Provinces is as follows :—

Distribution of Live Stock in the State at the end of 1901.

Electoral Province.	Horses.	Horned Cattle.	Sheep.	Pigs.	Camels.	Goats.	Donkeys.
Central	11,225	43,364	476,304	7,528	443	1,632	199
East	12,926	15,900	320,058	25,748	4	459	1
Metropolitan ..	2,069	1,344	949	828	5	18	..
Metropolitan Suburban	1,783	2,188	3,292	2,752	..	49	1
North	19,132	297,797	1,460,639	1,243	123	3,723	108
North-East ..	5,124	2,090	20,378	6,370	413	720	15
South	2,586	1,468	65,998	1,441	395	1,212	26
South-East ..	6,899	5,400	192,842	5,607	..	124	7
South-West ..	9,945	27,228	83,648	6,359	13	435	4
West	2,021	1,768	1,747	3,176	..	52	..
Total	73,710	398,547	2,625,855	61,052	1,396	8,424	361

An examination of the following figures relating to the importation of live stock into Western Australia during ten years affords ample evidence of the deficiency of the local supply.

Digitized by Google

Declared Customs Values of certain Live Stock imported into Western Australia during the Ten Years, 1892 to 1901.

	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	Totals.
	£	£	£	£	£	£	£	£	£	£	£
Calves	..	..	9	79	10	..	74	102	178	298	750
Camels	6,840	350	51,176	46,374	28,970	34,875	2,180	..	..	80	170,845
Cattle (for breeding)	224	975	1,836	7,282	10,451	5,679	4,817	4,190	7,382	5,581	50,131
Cattle (for slaughter)	..	144	1,819	37,298	68,820	119,078	170,059	78,694	113,439	124,458	713,886
Donkeys and Mules	..	130	212	23	191	..	10	..	259	90	915
Ewes (for breeding)	468	998	203	150	130	418	806	755	2,620	1,778	9,912
Horses	55,680	32,560	50,442	40,218	83,775	29,336	5,304	10,698	16,785	31,264	405,062
Horses (for breeding)	..	..	270	3,160	60	2,495	1,533	1,050	4,241	10,223	23,032
Pigs	..	70	52	2,479	8,181	9,246	11,729	5,985	5,776	3,922	47,825
Pigs (for breeding)	..	..	1	45	200	10	138	..	..	..	394
Rams	1,262	725	1,528	3,092	1,092	7,373	3,256	5,802	10,630	7,020	47,061
Sheep (for slaughter)	2,361	5	2,839	23,158	27,642	97,002	59,892	85,730	64,840	67,236	431,499
Total value	66,835	35,957	110,387	163,358	229,522	305,512	259,798	193,012	226,150	251,950	1,901,312

Digitized by Google

All stock imported into Western Australia from the Australian States and New Zealand must be accompanied by the certificate of a qualified Government inspector, and the declaration of the owner, or breeder, that they have been free from disease, and free from contact with diseased cattle, for the three months preceding shipment. In addition to these provisions, cattle (except for slaughter) undergo 30 days' quarantine, and camels 40 days, on arrival. Stock may be introduced by land from South Australia, by the road which crosses the border about eight miles North-East of Eucla, or in that portion of the Kimberley District East of the 127th meridian of longitude, at the following places:—Cockatoo Springs, Newry, or at the point on the border line of the two States where the Negri River crosses. Cattle so introduced must be accompanied by a declaration of health, made by the owner or breeder, immediately prior to their leaving for Western Australia. Quarantine stations for stock are temporarily declared by the Governor in Council as required.

Pigs, Poultry, and Bees.

For a more general recognition of the importance of and special attention to what may be termed the minor industries of the farm, such as pig-keeping, bee-keeping, and poultry-raising, this State offers unusual inducements, as the prices to be obtained in connection with these industries are such as would prove most remunerative. It may be said that practically speaking there is no ham, bacon, or lard produced in the State, almost all the pigs killed being used for pork. The amount of money sent out of this State for pig products is over £100,000 annually. The demand for pork keeps on increasing to such an extent that there are no pigs to spare for curing, as even the pork supply scarcely equals the demand. Pig-farming, combined with poultry-farming, is generally recognised as one of the most remunerative industries at the present time. It has also this advantage, that only a small area of land is necessary to carry it on, and the work is not heavy or laborious. To those who thoroughly understand poultry-breeding, this State offers unequalled advantages, as enormous quantities of eggs are imported yearly, and many parts of the land could not be equalled for rearing poultry. Turkeys cost almost nothing to keep if they have the free run of timber or scrub lands, and they will rear their chicks, if not interfered with, far more successfully than they would if given the closest attention. On some farms as many as 200 young turkeys are bred every year, the birds being allowed the free range of the bush, and to rear their young themselves in a practically wild state.

So far as bee-keeping is concerned, in suitable districts the average yields per hive are extremely satisfactory; an average of over 300 pounds per hive has been obtained in one apiary of over 100 hives, and over 600 pounds has been obtained from a single hive in one

Digitized by Google

season. The quality of the honey obtained from the red gum and banksia trees, which are the chief sources of supply, is very high, the honey having a flavour resembling the clover honey of the old country. For some years the wax moth almost decimated the bees in the State; but this has been overcome by the general introduction of the Ligurian bees, and there is nothing more to be feared from that source now

The numbers of the principal kinds of poultry in the State in the years 1896 to 1901 are shown below :—

	*1896.	*1897.	*1898.	*1899.	*1900.	*1901.
Turkeys ..	3,562	3,619	4,723	6,216	9,071	11,778
Geese ..	2,099	2,225	2,421	2,523	3,441	3,586
Fowls ..	181,430	230,843	257,018	304,794	319,383	318,816
Ducks ..	16,821	23,305	32,221	36,724	41,112	39,552
Total ..	203,912	259,992	296,383	350,257	373,007	373,732

* The returns are compiled from the Industrial Statistics Schedules, and many owners of poultry in towns and villages are not compelled by the Act to supply these forms. The figures, therefore, fall short of the actual number of poultry in the State.

The increase in the supply of poultry in the State, although a substantial one during the period of five years, is not commensurate with the demand, as is shown by the imports of poultry, both alive and dead (included in the Import Values of Farmyard and Dairy Produce), which amounted to £2,152 in 1901, the total value of poultry imported for the five years ended 31st December, 1901, being £15,337. These figures speak for themselves.

Returns for 1902.

At the end of the year 1902, the number of sheep in the State was 2,704,880 ; that of dairy milch cows, 24,324 ; of other cattle, 412,812 ; horses, 80,158 ; pigs, 52,883. The quantity of butter made during the year was 321,462lbs ; that of cheese made, 1,592lbs ; of bacon and ham made, 246,827lbs.

Stock Routes.

From Notes supplied by Daisy M. Bates.

As the Northern districts are more particularly suited to, and utilised for, the purposes of the pastoral industry, the question of stock routes is one of the greatest importance in that portion of the State of which Kimberley forms the Northern and the Murchison the Southern extremity. On this subject some valuable notes have been supplied by Mrs. Daisy M. Bates, who courageously tested the conditions of the routes by actual personal experience.

Digitized by Google

On the 23rd of April, 1902, Mrs. Bates started, on horseback, for her long ride of between six and seven hundred miles from Roebuck Plains, eighteen miles beyond Broome, with 770 head of cattle, their destination being Peak Hill, on the Murchison.

Her object in travelling personally with her cattle was to test the capacity of the wells on the Kimberley-Murchison stock route for watering a large mob, the mob which she accompanied being the largest that ever travelled down in one lot from Kimberley.

Unfortunately, only one well throughout the entire route (Wallal well) was capable of watering the whole number. Therefore, on arriving at the junction of the DeGrey and Shaw rivers, the cattle were taken off "the stock route" and travelled up the Shaw, then along Christmas Creek and Fortescue River, and on through the Ophthalmia Ranges into Ethel Creek, one of the head waters of the Fortescue. The journey was so severe on the cattle, owing to the bad state of the wells, that six months were occupied in bringing them from Roebuck Plains to Ethel Gorge; whilst the necessity for turning off the stock route at the DeGrey junction, and travelling them up the Shaw, resulted in the death of over twenty through poison, and also in lameness in many of the marsh-bred cattle, whose feet became very tender in the stony country that lay, with few intervals, between the mouth of the Shaw and Ethel Gorge. It was therefore not considered advisable, owing to the near approach of summer, to continue travelling the cattle towards their final destination, Peak Hill, the six months' journey having made most of them "leg weary." Many lame ones had to be left behind at the various stations *en route*, and it was consequently decided to rest them during the summer months at Glencarrick, Mrs. Bates' run on the Ethel, about one hundred and fifty miles from Peak Hill, where both good food and water abounded. Starting from Roebuck Plains, through Thangoo and Yardagarra stations, well-grassed plains were traversed. Then "pindan" bush, and broken country of ironstone and sandstone formation and dense curly-bark wattle scrub were negotiated, until the Ninety-mile Beach was reached. Water was, however, difficult to obtain from the very start. The grass in the neighbourhood of the Ninety-mile Beach, although apparently green and nourishing, was very poor herbage, rankly springing from rotten soil, and with not sufficient sustenance in it for either cattle or horses. As all the wells on the Ninety-mile were out of repair, the cattle suffered much in their journey over it, at one time being five days without water. Seven died at this period from thirst. There is no timber of any kind along the Ninety-Mile Beach until within a few miles of Wallal, where the only good well on the route was found. The pasturage improves slightly after Wallal is passed, but a number of settlers, who had taken up the country at various times, have been obliged to abandon it owing to the non-nutritive quality of the herbage, and hence there is

Digitized by Google

now no settlement until Pardu Creek is reached. A good deal of broken country, with patches of cajeput and wattle scrub, is met with between Wallal and Pardu. At the latter place a large area of poison country has to be passed through, between the Illareen Hills, before the Shaw River can be reached. Twenty cattle died from poison eaten at this place, and a mob of 200 bullocks, travelling down afterwards, lost fifteen of their number through poison here.

About thirty miles from Pardu Creek, crossing the DeGrey River at a point some distance below A. Edgar's DeGrey Station, the Shaw was struck, and then the cattle travelled along splendidly-grassed river flats for some twenty odd miles, when they entered stony and hilly country, with "pockets" (*i.e.*, flats) at irregular intervals. The mob had now to take to the bed of the river, depending for food on the shrubs that grew on the banks and on the pockets between the hills, water being obtained from pools under the banks. The hills continued to rise higher and the river bed became narrower as the Gorge was approached, and food became scarcer and scarcer owing to the absence of banks, the brown granite hills falling sheer down into the bed of the river. The Gorge was passed at a point some twelve miles below the Cooglegong River, close to where the tin mines are situated, and stony country was again traversed, but fortunately with good patches of grass on the "islands" in the Shaw. The cattle then travelled along the river bed, past the Black Range, until they came to a point twelve miles beyond Bamboo Springs, where the last pool in the Shaw was reached, when they were turned towards the Roy Hill Station on the Fortescue. The Fortescue has very little actual "channel" here, and spreads over a very considerable extent of country in flood time. The Queensland blue bush, a very succulent fodder for stock of all kinds, has obtained a good hold at Roy Hill, and as it only flourishes in country which is annually flooded, this is one of the very few places in Western Australia where it seems to grow plentifully.

Ethel Creek Station, twenty miles beyond Roy Hill, and about 120 miles from the Nullagine, has six excellent wind-mills on it, and between this place and Ethel Gorge two very deep wells have been sunk, 130ft. and 175ft. in depth. Forty miles from Ethel Creek Station the Ophthalmia Ranges are entered, and at Ethel Gorge, the only route through the ranges, there is a permanent pool of very good water. Between the Gorge and the Divide (on the other side of which the Ashburton takes its rise) there is some very good country, consisting of mulga flats running East and West, with good water obtainable at a few feet below the surface. On the 25rd October, this point was reached, and the cattle were settled down for the summer months.

The new Davis stock route runs five miles East of Glencarrick and fifteen from the Gorge, and when the wells between Wallal and

Digitized by Google

Eel Creek and between the head of the Davis River and Peak Hill are completed, the Kimberley-Peak Hill stock route will be considerably shortened.

The species of timber met with on the route followed comprised blood wood, beef wood, jam wood, box wood, cajeput, yeelbah, flood gum, blue gum, mulga, and a few baobab and kurrajong trees, and many species of wattle. A kind of scrub called "poverty bush" is spreading to a great extent in various parts of the Nor'-West, and threatens to become almost as great a nuisance as Bathurst burr. It is useless for fodder, and no other herbage will grow near it.

Mrs. Bates has suggested another and even more direct route than the Davis stock route as equally feasible for stock travelling. This route would come direct from the Fitzroy River, down Jurgurra Creek, and across country to the Oakover. The country between would require examination by some capable stockman, but several prospectors who have traversed the greater portion of it maintain that, if a sufficiency of wells were sunk at various points, the route throughout affords good feed for stock. The uninviting appearance of the rolling sandy plains a short distance inland from the Ninety-Mile Beach has led to the conclusion that the country is unsuitable for stock. This idea, however, requires to be further tested, as Yatheroo, and those splendid pastoral countries beyond the dreary sandplains near Moora and in the Melbourne district, were discovered long after that part of the country had been given up as "a hopeless sandy desert."

Another suggestion made by Mrs. Bates is, that a stock route should be opened up starting from the Ethel, somewhere about Sugarloaf Hill, and proceeding *via* Lake Nabberoo direct to Lake Way. This, she urges, would provide the Northern pastoralists with a much cheaper, shorter, and easier means of landing their stock, in a consequently much better condition than is possible under present circumstances, in the markets of all the East Murchison Goldfields towns.

Digitized by Google

3.—MINING.

MINERAL PRODUCTION.

(By A. Gibb Maitland, Government Geologist.)

General Return

Showing the Value of the Mineral Products of the State up to the end of 1901.

Minerals.	Estimated Value.			Remarks.
	£	s.	d.	
Asbestos	1	0	0	
Coal	151,108	0	0	
Copper	210,127	0	0	
Gold	29,722,650	0	0	Includes the value of the gold coined at the Mint.
Guano	318,488	0	0	
Iron (flux)	31,743	0	0	
Lead	378,062	0	0	Includes pig lead
Limestone (flux) ..	10,780	0	0	
Mica	294	0	0	
Precious Stones ..	1,024	0	0	
Silver	11,203	0	0	
Tin	192,499	0	0	
Total	**31,027,979**	**0**	**0**	

GOLD.

General.—The auriferous deposits of Western Australia have been responsible, up to the end of December, 1901, for the production of 6,997,302 ounces of fine gold, valued at £29,722,650, which figures include the whole of the raw gold entered for export, from the time of the first gold discovery in 1886, and also of that treated at the Perth Mint from its opening in 1899, which has either been exported or used for local purposes. The relations which these deposits, one of the factors of the State's prosperity, bear to the broader geological features, naturally take a prominent place in any account dealing with its mineral resources. The method adopted in dealing with the auriferous deposits is to describe each goldfield separately, giving a brief *apercu* of its salient features, although the information available for this purpose is, in one or two cases, much more fragmentary than could be wished. It has been found most convenient to adhere to a strictly geographical order in description, beginning with the field at the Northern extremity of the State. The description of each field is followed by a table, giving the yield of gold as shown by (*a*) the figures furnished to the Department of Mines, and by (*b*) the data in the archives of H.M. Customs House. It will be noticed that in all cases there is a difference between the two sets of figures. Up to the end of 1901 there have been officially reported to the Mines Department 6,960,863 ounces of gold from the various fields of the State; the Customs and Mint authorities, however, give 7,797,021 ounces as that entered for export, being 836,158 ounces in excess of the figures furnished to the Mines Department. The discrepancy is to be partly accounted for by the difficulty experienced in obtaining a record of the alluvial gold, and also by the fact that a good deal of the gold won in the early days was probably never officially reported. Writing in 1899, the Warden of Yilgarn notes, with reference to the output of gold from that district, that "a good deal of gold leaves the field and is not recorded."

Digitized by Google

The crystalline rocks—the matrices of the auriferous deposits—are divided into three broad parallel belts, formed of granite, gneiss, and schist, which trend generally North-West and South-East. Observations have shown that there are two fairly well-defined and more or less continuous ore-bearing belts, which have a distinct relation to the geotectonic features of the crystalline rocks. The schists, which constitute the principal auriferous belts, form long and comparatively narrow bands or attenuated elliptical patches. The schists consist of mica, chlorite, sericite, hornblende, and quartz, and serpentinous schists, together with hematite-bearing quartzites.

All the important auriferous areas occur within the limits or in the immediate vicinity of country occupied by the schistose rocks. These auriferous belts occupy a very large area of country, extending from the South Coast to the country lying between Spit Point and Cape Lambert, on the North-West Coast—extending over about 14 degrees of latitude. The auriferous belts exceed twenty miles in width in places. There is a larger area of auriferous country exposed at the surface than in any other portion of Australasia.

Gold Matrices.—Over the area occupied by the auriferous schistose rocks the ore deposits fall naturally into two broad divisions—

(*a.*) Lodes and other deposits in which the concentration of the precious metal has been subsequent to the formation of the enclosing rock.

(*b.*) Original alluvial deposits in which the gold has been concentrated by mechanical action contemporaneously with the formation of the rock itself.

The deposits included in Class (*a*) may be further subdivided into (1) veins, including stockworks; (2) dykes; (3) deep-reaching impregnations of zones of rock; (4) shallow impregnations of surface material. They are found chiefly in amphibolites and hornblende schists, but chloritic schists of somewhat doubtful origin frequently constitute the enclosing rock mass; and in the Northern parts of the State mica schists, slates, and quartzites or sandstones are also found as matrices.

Associated Minerals.—Of the metallic minerals which are found to accompany gold in Western Australia, by far the most important is iron pyrites, which, with its concomitant oxides of iron, is found in every ore body from Kimberley to Dundas. Not only is this mineral found in close conjunction with free gold, but in many instances, such as at Red Hill (Coolgardie Goldfield), is found itself to carry a considerable amount of gold imperceptible to the naked eye. As a rule, the pyrites does not constitute more than four or five per cent. of the gangue, but at some mines in Menzies and Mt. Ida, amongst other places, it forms one-half or more of the latter

Next in order of importance after pyrites is galena. It occurs in the gold reefs of Hall's Creek, Brockman's, and all the other Kimberley centres; but it is found that the richer the stone in galena, the poorer the gold. Galena also occurs in conjunction with gold at Tambourah and Horseshoe.

Vanadinite has been detected with gold at Coolgardie and Pinyalling.

Arsenopyrite accompanies gold at Ruby Creek, Niagara, and Coolgardie. Some beautiful specimens of this mineral have been obtained from Bayley's United Gold Mine, at Coolgardie. They consist of veined arsenopyrite, traversed in every direction by a network of veins of gold, varying in width from 1-20th of an inch down to a microscopic thickness.

Zinc Blende is an indication of rich ore at Yandicoogina, Coolgardie, and Lawlers; in each instance, however, forming a very small proportion only of the total gangue.

Native bismuth and bismutite are found in auriferous quartz at Burbanks, Dundas, Yalgoo, and Lawlers. At Burbanks the native bismuth is alloyed with gold to the extent of about one per cent. The bismuth at Lawlers is also, in all probability, alloyed with gold, since the surrounding scales of bismutite are thick with fine scales of metallic gold.

Pyrrhotite occurs in the quartz reefs of Southern Cross and Burbanks, in neither of which instances is it nickeliferous.

Chalcopyrite and copper carbonates occur in association with gold at Coolgardie, Sir Samuel, Tambourah, Hall's Creek, Gorge Creek, and many of the Murchison centres.

Bournonite is of frequent occurrence in the beds at Kalgoorlie, and is also said to accompany gold at Wiluna.

Native copper is reported from Coolgardie, Sir Samuel, and Roebourne.

Scheelite occurs in bunches in auriferous reefs at Coolgardie and Southern Cross, but in both instances is characteristic of poor ore.

Digitized by Google

Exceptional occurrences are those of Calverite, Coloradoite, Kalgoorlite, and other tellurides, together with Bournonite and Lollingite in the Kalgoorlie ores, and of native silver in auriferous quartz at Nannine. So, too, is that of asbolite, rich in cobalt and carrying freely visible gold, at Kanowna.

Of the earthy secondary minerals which accompany gold in Western Australia, quartz is the most important here, as elsewhere. Gold occurs in veins of calcite, more or less mangesian, at Mary River, Panton River, Kalgoorlie, Kanowna, and Red Hill (Coolgardie Goldfield). Chalcedony occurs in many quartz veins, and is characteristic of much of the better ore at Donnybrook. Gold has been found in gypsum at The Island, Lake Austin, and is of frequent occurrence in the oxidised zone at Kalgoorlie. Actinolite, chlorite, and other minerals derived from the enclosing rock mass are found in many quartz reefs, but probably owe their origin to agencies other than those which caused the deposition of the gold, and are for that reason of little interest.

Purity of Western Australian Gold.—Mr. Wallace, the Statist to the Department of Mines, estimates the average fineness of the gold produced during 1900 at 88·05, of a value of £3·741 per oz. So many impurities may, however, be added to, or removed from the gold, during the process of extraction from its ores, that these figures give only a very crude idea of the average composition of the native metal. That its fineness varies very largely in different parts of the State, and follows no rule as to latitude or longitude, is shown by the analyses in Table I., all of which were made on carefully-cleaned specimens of the native metal.

Composition of Native Gold.

No.	Nature of Gold.	Locality.	Specific Gravity.	Gold.	Silver.	Copper and Iron.
				%	%	%
1	Small alluvial nuggets ..	Hall's Creek, Kimberley	16·62	93·30	6·60	·10
2	Three-ounce alluvial nugget	do.	16·80	88·39	11·61	..
3	"Bobby Dazzler" nugget ..	Shark's Gully, Pilbara	14·66	76·81	23·04	·15
4	Gold from quartz boulders	Talga, Pilbara ..	16·20	84·46	15·54	..
5	Gold from conglomerate ..	Nullagine, Pilbara	..	91·21	8·79	..
6	Gold from quartz reef ..	Bamboo Creek, Pilbara	..	94·00	6·00	..
7	Do. do.	Towranna, Pilbara	..	94·53	5·47	..
8	Do. do.	Peak Hill, Peak Hill	17·16	96·54	3·46	..
9	Do. do.	Nannine, Murchison	15·75	89·45	10·50	..
10	Sponge gold from lode ..	Boulder, Kalgoorlie, East Coolgardie	..	99·91	·09	*Nil*
11	Coarse gold from ironstone pebbles	Block 50, Coolgardie	18·91	99·46	·64	Trace.
12	Crystalline gold from calcite vein	Red Hill, Coolgardie	18·00	93·21	6·72	..
13	Gold from alluvial	Preston River, South West	..	92·90	7·10	..
14	Electrum from quartz reef	Donnybrook, Donnybrook	..	49·29	50·71	..

KIMBERLEY GOLDFIELD.

The most Northerly goldfield in the State is that of Kimberley, which was discovered in 1882 by Mr. E. T. Hardman, then Government Geologist, and Messrs. Hall and Slattery.

The goldfield, which embraces an area of 46,886 square miles, was proclaimed on the 20th May, 1886. The boundaries, as defined by the authorities, are as follows:—

Bounded on the North by the 16th parallel of South latitude; on the South by the Southern boundary of the Kimberley District (latitude 19° 30′ South); on the West by the 126th meridian of East longitude; and on the East by the Eastern boundary of the State (longitude 129° East).

Digitized by Google

The strata exposed on the goldfield consist of Crystalline Schists of Archæan Age, together with representatives of Cambrian, Devonian, and Carboniferous systems, as well as a large development of volcanic rocks.

The *Crystalline Schists* and allied rocks, the matrices of the metalliferous deposits, are highly developed in Kimberley. They consist of micaceous and talcose schists, gneiss, and granite. They have been proved to extend from near Denham River to Mount Dockrell, and appear again in the Mueller Range, a little further West; and, striking North-Westwards, pass through the King Leopold Range to King Sound. This belt of rocks varies in width from 10 to 30 miles, and has been proved to have a horizontal extent of at least 120 miles, and probably continues much further.

Mining operations on the Kimberley field have been chiefly confined to six principal centres, viz.: The Panton, Hall's Creek (the official centre of the field), Brockman's, Ruby Creek, the Mary River, and Mount Dockrell.

Very little mining appears to be going on, for during 1901 the only mine at work was the Ruby Queen.

Up to the end of 1901 the Kimberley field yielded, according to the Mines Department figures, 15,188ozs. of gold; the Customs authorities, however, report that up to the same date 26,678ozs. were entered for export. There is thus a discrepancy of 11,490ozs. between the two different sets of figures. This difference may in all probability represent the yield of alluvial gold, which, unless under exceptional circumstances, was in the early days never reported to the Government.

The following table shows the yield of the Kimberley Goldfield up to the close of 1901, as deduced from official data:—

Yield of Kimberley Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1886			302·00	270·17	
1887			4,873·00	4,359·37	
1888			3,493·00	3,124·82	
1889			2,464·00	2,204·28	
1890			4,474·00	4,002·42	
1891	*a*13,199·50	12,734·00	2,699·62	2,415·07	*a* Details not available
1892			1,088·85	974·08	
1893			1,621·70	1,450·77	
1894			588·64	526·59	
1895			876·68	784·27	
1896			891·86	797·85	
1897 ..	383·50	229·30	554·07	495·67	
1898 ..	175·00	*b* 440·17	287·88	257·54	*b*. Includes 310 ozs. of alluvial
1899 ..	694·00	*c* 917·15	1,122·81	1,004·46	*c*. Includes 417 ozs. of alluvial
1900 ..	586·50	*d* 571·15	676·62	605·30	*d*. Includes 331 ozs. of alluvial
1901 ..	185·00	*e* 297·06	663·37	601·26	*e*. Includes 164 ozs. of alluvial
Total ..	15,223·50	15,188·83	26,678·10	23,573·92	

Digitized by Google

PILBARA GOLDFIELD.

The Pilbara Goldfield was proclaimed on the 1st October, 1888. It embraces an area of 34,880 square miles.

Its boundaries, as defined by amendment gazetted on the 20th September, 1895, which took effect on the 1st November of that year, are as follows :—

Bounded by a line starting from a point on the sea-coast Eastward from Condon Creek and extending through the summit of Poolingerena (or Mount Blaze) to a spot due North from the summit of Mount Macpherson; then South through the said summit to a spot due East from the summit from Mount Marsh, on the Upper Fortescue River; thence due West through the summit of Mount Marsh to the right bank of the Fortescue River, along it downwards to Survey Station V23; thence in a Northerly direction through Survey Station V32 to the right bank of the Cocreaca branch of the Yule River, and along the right bank of the Cocreaca Creek and the Yule River, downwards to the sea-coast, and along the sea-coast Eastward to the starting point.

Very little is known with reference to the geology of the Pilbara Goldfield, for with the exception of a hurried visit by the ex-Government Geologist some years ago, no official examination of the district has been made, hence our knowledge of the ore deposits and their mode of occurrence is much more meagre than could be desired.

There are six principal mining centres on the goldfield, viz.: Bamboo Creek, Talga Talga, Nullagine, Marble Bar, the Shaw, and Tambourah.

At Nullagine is a conglomerate, which has been worked for the gold it contains. Crushings from the outcrop have yielded as much as 2ozs. to 4ozs. of gold to the ton. The conglomerate occurs in ranges which rise to about 100 to 150 feet above the level of the surrounding country. The gold, which seems to occur in well defined bands, is of a secondary nature.

In some respects this auriferous conglomerate bears a close resemblance to those auriferous conglomerates of the Rand, better known, perhaps, as banket deposits.

The gold yield of 16,617ozs. for the year 1900 showed a falling off of 2,675ozs. as compared with 1899; but the average yield per ton of ore milled was 2·43ozs. as against the average of 2·09ozs. for 1899. The reefs are rich, and the average production of 135ozs. of gold per man employed is high.

The small output for 1901, a decrease of 38 per cent. as compared with the yield for the previous year, is partly attributable to the fact that several of the mines changed owners, and the new holders ceased crushing operations in order to develop their properties. Over 1,000ozs. of alluvial gold were obtained during the year. The experiment of driving two or three of the small batteries by windmills was successfully tried.

Digitized by Google

The following table shows the yield of the Pilbara Goldfield up to the close of 1901:—

Yield of the Pilbara Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at the Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1889			*a* 11,170·00	9,992·63	*a*. Includes export from West Pilbara
1890			*a* 16,055·31	14,363·01	
1891			*a* 11,875·00	10,623·32	
1892	11,121·10	*b* 26,388·56	*a* 12,892·80	11,533·84	*b*. Includes 2,082 ozs. from unknown tons
1893			*a* 11,698·50	10,465·43	
1894			*a* 16,254·50	14,541·20	
1895			*a* 19,522·40	17,464·65	
1896			*a* 11,810·11	10,565·27	
1897 ..	5,138·70	6,825·26	*a* 11,955·87	10,695·67	
1898 ..	6,719·75	*c* 14,413·79	11,662·56	10,433·27	*c*. Includes 2,000 ozs. of alluvial and 102 ozs. dollied and specimens
1899 ..	7,567·55	*d* 19,291·98	20,526·20	18,362·65	*d*. Includes 2608·29 ozs. alluvial and 833·72 ozs. dollied and specimens
1900 ..	6,173·71	*e* 16,616·85	17,140·51	15,333·82	*e*. Includes 1527·54 ozs. of alluvial and 88·92 ozs. dollied and specimens
1901 ..	5,414·11	*f* 10,264·32	11,320·40	10,260·43	*f*. Includes 1050·55 ozs. of alluvial and 275·52 ozs. dollied and specimens
Total ..	42,134·92	93,800·76	183,884·16	164,635·19	

West Pilbara Goldfield.

The West Pilbara Goldfield, 9,480 square miles in extent, originally included in the Pilbara Goldfield, was created a separate field by proclamation gazetted on the 20th of September, 1895, to take effect from the 1st November of that year.

The authorities define the boundaries as follows:—

The portion of Crown lands bounded by a line starting from the sea-coast, at the mouth of the Fortescue River, and extending along the right bank of the said river upwards to Survey Station V23; thence in a Northerly direction through Survey Station V32, to the right bank of the Cocreaca branch of the Yule River, and the right bank of the Cocreaca Creek and the Yule River, downwards to the sea-coast, and along the sea-coast Westwards to the starting point.

Mining operations, however, are confined at the present time to but a few centres.

The yield of the field for 1899 showed a very large decrease on that for 1898, but the output of 954ozs. for 1900 is only about half that for the previous year; in 1901 the decrease amounted to 76 per cent. as compared with that of 1900.

Digitized by Google

The following table shows the yield of the West Pilbara Goldfield up to the close of 1901:—

Yield of the West Pilbara Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896	160·00	337·91	*a*	*a*	*a*. Previously shown in the Pilbara (*Vide ante*)
1897 ..	608·85	860·06	*a*	*a*	
1898 ..	202·30	326·70	2,028·27	1,814·48	
1899 ..	879·85	*b* 1,934·80	1,955·51	1,749·39	*b*. Includes 735·07 ozs. of alluvial
1900 ..	681·15	*c* 953·65	721·68	645·61	*c*. Includes 537·46 ozs. of alluvial
1901 ..	48·00	*d* 231·29	480·86	435·84	*d*. Includes 136 34 ozs. of alluvial and ·45 ozs dolled and specimens
Total ..	2,580·15	4,644·41	5,186·32	4,645·32	

Ashburton Goldfield.

The Ashburton Goldfield was proclaimed on the 11th December, 1890.

As at present constituted, it embraces an area of 14,252 square miles. Its boundaries, defined by amendment gazetted on the 18th October, 1901, to take effect from the 14th of that month, are as follows:—

Bounded by lines starting from the summit of Mt. De Courcey; thence East by South to the summit of Mt. Wall; thence about South-East by East to Trig. Station $\frac{\uparrow}{10}$; thence about South-East by South to the summit of Mt. Bresnahan; thence South-West by South 37 miles along the North-West boundary of Peak Hill Goldfield; thence by a line running about North-West by West to the summit of Mt. Palgrave; thence Southerly along the West boundary of the Gascoyne Goldfield about 17 miles; thence due West, passing through Trig. Y2, about 56½ miles; thence due North about 113½ miles to a point due West of a point 7½ miles North of Trig. Station on Red Hill; thence due East, passing through aforesaid point, about 77½ miles to a point due North of Mt. De Courcey; thence South about 49¼ miles to the starting point.

This field is situated on the Ashburton River, and extends from a point 150 miles from its mouth for 150 miles inland. The Ashburton River, for the most part, flows over large alluvial plains, with low ridges of clay, slate, and quartz outcropping here and there, and flat-topped ranges away to the South; but in one place, called the Gorge, the hills close in upon the river, which then flows in a deep rocky channel for the space of a few miles.

Most of the gold workings lie on the Southern side of the river, the only exception being the "Dead Finish." Until quite recently

Digitized by Google

all the work on this field was alluvial digging, but a few leases on reefs are now held, the alluvial diggings being now almost deserted.

The field consists of seven main centres, viz.: Main Camp, Dead Finish, Star of the West, Top Camp, The Gorge, Mount Mortimer, and New Find.

The auriferous belt of country extends from the junction of the Hardey River with the Ashburton, a little to the North-East of Mount Clement, following the latter river in a South-East direction for about 150 miles. It is bounded on the South by the Barlee Range and a flat-topped tableland, which follows, at a distance of 14 miles to the South, the main course of the river. To the North it extends across the Ashburton and Hardey Rivers to Mount Wall and Mount De Courcey, a distance in a Northerly direction from the river of from 20 to 30 miles, giving an auriferous area of about 10,000 square miles.

No mining progress ot any importance is to be recorded during the year 1900, operations being principally directed towards alluvial mining, which gave employment to about fifty-nine men during the year, the yield of alluvial gold being 1,704ozs. During 1901 very little progress was made.

The following table shows the yield of the field up to the close of 1901:—

Yield of the Ashburton Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1891 ..	*a*	*a*	838·72	750·31	*a*. No detailed records given
1892 ..	*a*	*a*	·70	·63	
1893 ..	*a*	*a*	467·74	418·43	*b*. Alluvial, dollied, and specimens.
1894 ..	*a*	*a*	285·27	255·20	
1895 ..	*a*	*a*	540·76	483·76	*c*. Alluvial, dollied, and specimens.
1896 ..	*a*	*a*	669·17	598·64	
1897 ..	*a*	*b* 302·95	1,038·18	928·75	*d*. Alluvial and dollied.
1898 ..	*a*	*c* 500·63	449·88	402·46	
1899 ..	*a*	*d* 1,659·10	521·30	466·36	*e*. Alluvial.
1900 ..	*a*	*e* 1,704·00	524·36	469·09	*f*. Alluvial.
1901 ..	*a*	*f* 992·00	63·92	57·94	
Total ..	..	5,158·68	5,400·00	4,831·57	

Gascoyne Goldfield.

This goldfield, which embraces an area of 5,061 square miles, was officially proclaimed on the 25th of June, 1897, the proclamation to take effect from the 15th April of that year. The boundaries are thus defined by the authorities:—

Starting from the summit of Mount Palgrave, and extending about South-East by South to a point situate 37 miles from the summit of Mount Bresnahan in direction of Trig. Station K20; then about South-West by South to the said Trig. Station K20; thence about South-West to the summit of Mount Gascoyne; thence about North-West by North to the summit of Mount Agamemnon; thence Northward to the summit of Mount Palgrave, the starting point.

Digitized by Google

The field, though geographically distinct, has been placed under the charge of the same Warden as the Ashburton.

Prospecting operations are chiefly confined to the neighbourhood of Bangemall, the official centre of the field, but no details as to the nature and mode of occurrence of the ore deposits are available.

The yield of this goldfield, as can be seen by the official figures appended, was up to the close of 1901, small.

Yield of the Gascoyne Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1897 ..	1·35	*a* 13·55	*d*	*d*	*a.* Includes 6·80ozs. dollied and specimens.
1898 ..	*d*	*b* 13·50	*d*	*d*	*b.* Dollied and specimens.
1899 ..	235·35	*c* 333·77	418·72	374·59	*c.* Includes 119·43 ozs. of alluvial.
1900 ..	*d*	*e* 74·00	86·10	77·02	
1901 ..	*d*	*e* 90·00	25·83	23·41	*d.* Details not available.
Total ..	236·70	524·82	530·65	475·02	*e.* Alluvial.

Peak Hill Goldfield.

The Peak Hill Goldfield, which comprises an area of 12,194 square miles, was established by proclamation gazetted on the 19th of March, 1897, to take effect from the 1st April of that year. The authorities define its boundaries as follows:—

The portion of Crown lands bounded by lines starting from an angle in the Northern boundary of the Murchison Goldfield, at the summit of Mount Hale, and extending along the said boundary in an East-South-Easterly direction to another angle at the summit of Mount Russel; thence due North to the North-Easterly corner of the East Murchison Goldfield, latitude being on the 26th parallel of South latitude; thence in a Northerly direction to Trig. Station L15 on Wonyuegunna Hill; thence in a North-Westerly direction to the summit of Mount Bresnahan, between the Angelo River and the Upper Ashburton; thence in a South-Westerly direction to Trig. Station K20 on a peak near the source of the Lyons River; thence still South-Westerly to the summit of Mount Gascoyne; thence South-South-Easterly to the starting point on the summit of Mount Hale.

The goldfield includes within its boundaries the high ground lying at the heads of the Gascoyne and the Murchison Rivers.

At the present time mining operations are chiefly confined to the vicinity of Peak Hill, the official centre, and the Horseshoe Diggings, some miles to the North.

A new find was reported during the year 1900 at Wilguna, about 12 miles East-South-East from Peak Hill.

By far the larger portion of the goldfield upon which mining operations on any scale are carried out consists of undulating country, situated on the lofty plateau drained by the heads of the Murchison and the Gascoyne Rivers.

Digitized by Google

The mines at Peak Hill are situated on a flat at the foot of a small quartzite hill, from which the place takes its name.

The country rock consists of banded, and in places, granular quartzites (with secondary silica), mica schists, or quartzites. A remarkable feature are the masses, veins, or dykes of pure silica, which traverse certain portions of the field. In a few places these veins present the appearance of massive quartzite, but their mode of occurence at angles transverse to the strike of the adjacent strata confute this view. In one of these mines a vein of this character is seen cutting across an auriferous quartz reef. The majority of the quartz dykes trend North-East and South-West, and preserve a wide parallelism, they are generally inclined at high angles, but not far from the vertical. They have not, however, proved to be remuneratively auriferous. The ore bodies consist of a mass of country rock, traversed by a network of interlacing veins of auriferous quartz, where the gold is not confined to the reef or veins, but appears to be disseminated through the decomposed country rock.

Resting upon the underlying rocks of the field is a variable thickness of recent superficial deposits. These consist of loose gravel or loam, from which gold is obtained by the usual method of dry-blowing. There is, unfortunately, no record as to what amount of gold has been obtained from this loose material, unless it is represented by the 3,349ozs. recorded in 1895.

This gravel reposes directly upon an irregular surface of an iron-stained cement, which rests upon an old eroded watercourse, and fills up all the inequalities in the latter, which, however, are of no great depth. In some cases erosion has succeeded in cutting down the cement to bed rock, and exposing the underlying schists. Lithologically the cement is an ordinary conglomerate, formed by the mechanical action of water, and deposited in an old creek bed. The pebbles are embedded in a matrix of sand, formed of the comminuted remains of the underlying rocks. The component parts of the cement are in every way identical with those of the rocks at present outcropping, whilst the number of quartz pebbles are similar in character to the quartz forming those reefs by which the country rock is traversed. The gold in the cement is not exclusively in grains, scales, or nuggets, but is also found attached to its original quartz matrix. The amount of gold won from the cement has been considerable; the official returns demonstrate that. As to whether the 4,552ozs. of gold returned, previous to 1897, from an unknown tonnage of quartz, were obtained from the cement or from the superincumbent loose gravel, the official data afford no clue.

Though the general development of this field has not been unsatisfactory, the gold yield of 26,572ozs. during 1900 shows a falling off of about 17 per cent. as compared with that of the previous year. This decrease is more than accounted for by the smaller output from the principal producing mine—the Peak Hill Goldfields, Limited—so really the production of the field generally shows a slight increase.

Digitized by Google

The progress of this field during 1901 was somewhat disappointing, the yield of gold having fallen to 20,255ozs; the decline being partly due to the falling off in the output of the Peak Hill Goldfields property, and partly owing to the closing of the State battery.

The following table shows the yield of the goldfield up to the close of 1901:—

Yield of the Peak Hill Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1894					*a.* Included in the Murchison export returns.
1895	1,043·85	*b* 11,070·15	*a*	*a*	*b.* Includes 4,551·60 ozs. from unknown tonnage.
1896					
1897 ..	2,851·25	*c* 10,883·48	5,110·00	4,571·38	*c.* Includes 399ozs. dollied and specimens.
1898 ..	4,018·09	*d* 14,969·32	13,736·85	12,288·93	*d.* Includes 368·80 ozs, dollied and specimens.
1899 ..	10,922·00	*e* 31,953·65	31,995·34	28,622·88	*e.* Includes 478·90 ozs. dollied and specimens.
1900 ..	16,254·60	*f* 26,571·63	28,669·86	25,647·93	*f.* Includes 24·85ozs. dollied and specimens.
1901 ..	24,025·50	20,255·47	21,607·47	19,584·29	
Total ..	59,115·29	115,703·70	101,119·52	90,715·41	

Murchison Goldfield.

The Murchison Goldfield, as originally constituted, was first proclaimed on the 24th of September, 1891; its boundaries were modified by proclamation gazetted on the 8th of February, 1895, to take effect from the 23rd January of that year. It embraces an area of 20,513 square miles. As defined by the authorities, the goldfield is,—

Bounded by lines starting from the summit of Mount Murchison, and extending North-Eastward to the summit of Mount Hale; thence East-South-Eastward to the summit of Mount Russel; thence South-Westward to the North-West corner of the Yilgarn Goldfield; thence West-North-Westward to the summit of Wyemandoo Hill, and onwards to Trig. Station K6 on Goonahmoudey Peak; thence North-Westward to the summit of Mount Farmer; and onwards to the summit of Mount Luke, and onwards to the summit of Mount Murchison.

Along the principal belt of auriferous country on the Murchison, the rocks for the most part strike a little to the Westward of North, and underlie to the Westward, consisting largely of talcose and granitic rocks, although hornblende and micaceous slates are also met with.

The rocks at the North end of the field take a sudden turn to the North-East and East. Dykes are met with in many places; these are generally either granite or diorite, the latter being of great variety, whilst the former generally contain crystals of foliated talc in cavities.

The mineral veins consist mostly of quartz, but ferruginous lodes and veins of calcite and dolomite also exist. The quartz is of great variety, from pure white, with talc in the granite country, to white,

Digitized by Google

blue, and highly mineralised in other places, whilst the dolomites and calcites are mostly ferruginous.

Where the reefs have been opened up to the water-level, they seem for the most part to be true fissure veins, most of them probably continuing in depth; but they will vary greatly in size, direction, and thickness, and many will have to be traced by a mere line or face for a considerable distance. The veins rarely follow the strike or dip of the other rock, but cut across them in all directions, and when they are lost at the ends they generally seem to turn and strike along the line of bedding of the rocks as a mere thread, for sometimes a considerable distance, making again into a large body of stone, when they strike off more or less on their old course.

For administrative purposes the Murchison Goldfield has been divided into four districts, viz., Nannine, Cue, Day Dawn, and Mount Magnet.

Marked progress was made by the Murchison Goldfield during the year 1900; its yield of 105,722ozs. shows an increase of 31 per cent. above that of 1899, whilst the average per ton of ore crushed is fairly maintained, being for 1900 1·05ozs., as against 1·16ozs. in 1899.

During 1901, the gold yield, 146,592ozs., showed a further increase, being about 39 per cent. over that for 1900.

No new alluvial deposits appear to have been discovered during 1901, those engaged in alluvial mining having apparently confined their attention to ground that has previously been worked.

The following table gives the yield of the Goldfield since date of opening up to close of 1901:—

Yield of the Murchison Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1891			2,064·43	1,846·83	*a.* Includes 2,340 ozs., dollied and specimens.
1892			24,356·47	21,789·19	*b.* Includes 1041·67 ozs. dollied and specimens
1893	110,805·00	*a*139,360·28	21,210·45	18,974·77	*c.* Includes 1,119·12 ozs., dollied and specimens.
1894			52,946·32	47,365·54	*d.* Includes 199·13 ozs. of alluvial and 2,844,50ozs. dollied and specimens.
1895			65,477·26	58,575·66	*e.* Includes 512.50 ozs., of alluvial and 3,273·29 ozs. dollied and specimens.
1896			71,282·69	63,769·17	*f.* Includes 1412.07 ozs. of alluvial and 856·86 ozs. dollied and specimens.
1897 ..	72,003·80	*b*62,316·19	82,891·85	74,154·67	
1898 ..	92,255·80	*c*79,256·39	93,667·16	83,794·22	
1899 ..	66,696·87	*d*80,548·71	93,518·03	83,660·80	
1900 ..	96,791·03	*e*105,722·31	108,696·58	97,239·47	
1901 ..	113,213·43	*f*146,591·93	144,693·86	131,145·66	
Total ..	551,765·93	613,795·81	760,805·19	683,315·98	

Digitized by Google

MOUNT MARGARET GOLDFIELD.

This Goldfield, which was previously included in the North Coolgardie Field, was declared by proclamation gazetted on the 12th March, 1897, to take effect from the 1st April of that year; its boundaries were amended by proclamation gazetted on the 24th of December, 1897, taking effect on the 1st January, 1898, so as to embrace an area of 42,154 square miles.

The boundaries, as defined by the authorities, are as follows:—

Bounded by lines starting from a spot about 15 miles East and about 13 miles North from the summit of Mount Ida, and extending North about 25½ miles; thence East about 74¼ miles, passing through a tree marked AN 33 at Doyle's Well to a spot about 2 miles 10 chains West and about 35½ miles North from a tree marked B 82 at Brickey's Soak; thence North to the 26th parallel of South latitude: thence East to the 125th meridian East longitude, and South along that meridian to a spot due East of said tree marked B 82 at Brickey's Soak; thence West through the said tree to the starting point.

The Mount Margaret Field, which bids fair to rise to some prominence as a gold producer, has never been the subject of an official geological report, hence our knowledge of the mode of occurrence and association of the ore bodies is somewhat meagre.

A very large portion of the surface of the ground is covered with a variable thickness of recent accumulations, derived from the disintegration of the underlying rocks, this forms the matrix of the alluvial gold.

The staple formation is granite, granitic gneiss, schists, and quartzites intersected by basic volcanic rocks. The schists are often vertical, or inclined at high angles, and are traversed with quartz reefs, many fragments of which are strewn over the surface. Some of the quartzites stand up in bold relief, and can be traced by the eye for some miles across country. It is associated with one of these bands of quartzite that the ore body in the West Australian Mount Morgan occurs. This quartzite is impregnated with oxide of iron in places, while at others it is very spongy and sintery. The Sons of Gwalia Mine is another, in which the ore body is associated with quartzite or quartz schist.

Of all the goldfields of the State the Mount Margaret Field shows the greatest advance during the year 1900. In 1899 it produced about five per cent. of the total reported yield of Western Australia, while in 1900 its production of 145,689ozs. amounted to 9·62 per cent. of the yield, the average per ton of ore treated being 1·09ozs., as against 1·04ozs. for the previous year. The average number of men employed shows an increase of 536 as compared with the total for 1899, while the average number of ounces of gold per man employed rose from 60·05ozs. in 1899, to 78·02ozs. in 1900.

During the year 1901 this Goldfield made further great strides, the reported output exceeding that for the previous year by 44,343ozs., whilst its total output amounted to about 10·3 per cent. of the yield of the State. The average number of men employed in the mines was 275 more than that during the previous year, and the number of ounces of gold produced per man employed was 88·53 as against 78·20ozs. in 1900.

Digitized by Google

The following table shows the yield of the Mount Margaret Field since its inception up to the end of 1901 :—

Yield of the Mount Margaret Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1895 1896	231·00	*b* 4,992·10	*a*	*a*	*a*. Previous to 1897 included in North Coolgardie return. *b*. Includes 300ozs. dollied and specimens.
1897 ..	13,198·74	*c* 22,592·09	8,685·73	7,770·22	*c*. Includes 588·84 ozs. of alluvial, and 2,018·25ozs. dollied and specimens.
1898 ..	37,506·67	*d* 49,717·77	43,266·69	38,706·19	*d*. Includes 675·25 ozs. of alluvial, and 378·68ozs. dollied and specimens.
1899 ..	75,586·35	*e* 79,923·72	81,817·07	73,193·17	*e*. Includes 345·05 ozs. of alluvial, and 601·18ozs. dollied and specimens.
1900 ..	132,821·25	*f* 145,688·75	141,523·00	126,605·83	*f*. Includes 5·20ozs. of alluvial and 1,271·79ozs., dollied and specimens.
1901 ..	246,578·00	*g* 190,032·15	198,807·70	180,192·63	*g*. Includes 604·06 ozs. of alluvial, and 1,215·22ozs. dollied and specimens.
Total ..	505,922·01	492,946·58	474,100·19	426,468·04	

Yalgoo Goldfield.

The Yalgoo Goldfield was declared by proclamation gazetted on the 8th February, 1895, taking effect from the 23rd January of that year. Its boundaries, which enclose an area of 18,921 square miles, are thus defined by the authorities :—

Starting from the summit of Mount Murchison and extending West-South-Westerly to the summit of Tallering Peak ; thence South-Easterly to the summit of Mugga Mugga Hill, and onwards to the summit of Mount Gibson, which lies about 12 miles South-West from Ningham Creek ; thence Eastward to Trig. Station K 83 on the West shore of Lake Moore ; thence due East to the Western boundary of the North Coolgardie Goldfield, and along it North to its North-West corner thence North-Westward to the summit of Wyemandoo Hill, and onwards to Trig. Station K 6 on Goonahmoudey Peak ; thence North-Westward to the summit of Mount Farmer, and onwards to the summit of Mount Luke, and onwards to the summit of Mount Murchison.

During the year 1900 the progress of this Goldfield was not satisfactory ; of its total gold yield of 10,102ozs., more than half was accounted for by the output of one property, the Field's Find Mine, and the yield of the field showed a falling off as compared with that for 1899. During 1901, mining operations were very quiet, the gold yield showing a further decrease of 9 per cent. on that of 1900.

Google

The following table shows the progressive yield of the Goldfield up to the close of 1901 :—

Yield of the Yalgoo Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1895 } 1896 }	a2,488·00	a7,227·00	b	b	a. Details not available.
1897 ..	3,666·97	3,455·79	2,034·23	1,819·81	b. Previous to April, 1897, included with Murchison.
1898 ..	4,424·50	3,298·95	3,756·38	3,360·44	
1899 ..	17,933·51	c 12,135·94	10,879·58	9,732·83	c. Includes 16·50ozs. dollied and specimens.
1900 ..	15,596·20	d10,101·86	9,368·57	8,381·08	d. Includes 289ozs. dollied and specimens.
1901 ..	13,117·30	e 9,238·25	9,198·51	8,337·22	e. Includes 12·08ozs. of alluvial, and 4·90 ozs. dollied and specimens.
Total ..	57,226·48	45,457·79	35,237·27	31,631·38	

North Coolgardie Goldfield.

This Goldfield was proclaimed on the 28th June, 1895, its boundaries being subsequently amended by proclamation gazetted on the 12th March, 1897, to take effect from the 1st April of that year; it embraces an area of 30,609 square miles, and, according to the authorities, is circumscribed :—

By lines starting from the Southernmost corner of the Murchison Goldfield, being the South-West corner of the East Murchison Goldfield, and situate about 12 miles East and five miles South from Trig. Station K 75 on Wyemando Hill, and extending South to the South-East corner of the Yalgoo Goldfield, which is a point due East from Mount Gibson, near Lake Moore, and due North of a spot 10 miles West of a cairn on Yorkrakine Granite Rock; thence East-South-East to a point about 50 miles due West from a cairn marked NB 1, near Wangine Soak; thence East to Survey Station NB 1.; thence about 87° 20 miles 22 chains to Survey Station R 3; thence East to the 125th meridian East longitude; thence North along that meridian to a point East of a tree marked B 82 at Brickey's Soak; thence West through the said tree to a spot about 76¼ miles West from it, and 13 miles North and 15 miles East from the summit of Mount Ida; thence North about 31 miles to the South boundary of the East Murchison Goldfield, and West to the starting point.

This field, which originally formed part of the Coolgardie Goldfield, has, for purposes of administration, been subdivided into the Menzies, Ularring, Niagara, and Yerilla districts.

In its geological structure, the field presents features which connect it geologically with those of Kalgoorlie and Coolgardie. The country rocks consist of granite, gneiss, hornblende, mica, sericite, and serpentinous schists, associated with amphibolites, ferruginous quartzite, and diorite dykes. Felsite dykes have been noticed in some parts of the district. Ferruginous conglomerate, passing in places into pure limonite, occupies the caps of certain of the hills. All the the rocks have suffered a considerable amount of decomposition, which extends to a depth of about 100 feet from the surface

Digitized by Google

The lodes of Menzies, which are of a more or less schistose habit, have an approximate parallelism: they trend generally North-West, and have a fairly high underlie to the West. The gold occurs associated with iron, copper, and arsenical pyrites, galena (which is very abundant), and zincblende. Free gold occurs in the rocks within the zone of oxidation.

The gold yield of 106,774ozs., during 1900, from this extensive field, showed a falling off, as compared with 1899, of about nine per cent. The decrease was, however, confined to the Menzies and the Yerilla districts, increases appearing in the Ularring and Niagara districts. The year 1901 was one of general progress, though no new find of any importance was made. The reported yield of 148,305ozs. showed an increase of about 39 per cent. as compared with that for 1900, while the average per ton of ore crushed increased from 1·16 to 1·36 ounces. The population of the field also slightly increased, while the number of men employed on gold mines, viz., 1,753, showed an increase of 243 as compared with that of 1900.

The following table shows the yield of the field up to the close of 1901:—

Yield of the North Coolgardie Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
Previous to 1897	14,265·30	*a* 26,687·85	*g* 17,160·51	15,351·71	*a*. Includes 2,900·77 ozs., dollied and specimens.
1897 ..	32,840·95	*b* 61,362·82	74,556·12	66,697·57	*b*. Includes 120ozs. of alluvial, and 391·12ozs., dollied and specimens.
1898 ..	42,032·79	*c* 72,878·88	70,625·32	63,181·09	*c*. Includes 924·32 ozs., dollied and specimens.
1899 ..	93,222·25	*d* 116,968·14	105,688·76	94,548·69	*d*. Includes 796·78 ozs. of alluvial, and 1,118·34ozs. dollied and specimens.
1900 ..	90,727·99	*e* 106,773·97	106,193·38	95,000·12	*e*. Includes 690·05 ozs. of alluvial, and 649·32ozs. dollied and specimens.
1901 ..	108,271·65	*f* 148,305·00	142,798·10	129,427·40	*f*. Includes 281·79 ozs. alluvial, and 969·62ozs. dollied and specimens.
Total ..	381,360·98	532,976·66	517,022·19	464,206·58	*g*. Included with Coolgardie returns prior to 1st May, 1896.

YILGARN GOLDFIELD.

The Yilgarn field was proclaimed on the 1st October, 1888; its boundaries were amended by proclamation gazetted on the 20th

Digitized by Google

March, 1896, taking effect from the 15th April of that year. It embraces an area of 15,593 square miles:—

Bounded by lines starting from a point 90 miles South of a cairn, H 26, on Koorarawalye Granite Rock, and extending West to a point due South of a point 10 miles West of a cairn on Yorkrakine Granite Rock; thence North to the South-East corner of the Yalgoo Goldfield; thence East-South-East to a point about 50 miles due West from a cairn marked NB (conjoined) 1, near Wangine Soak; thence South through the before-mentioned cairn H 26 to the starting point.

The occurrence of gold in what is now the Yilgarn Goldfield would seem to have been made known by Mr. Glass, of Mugakine, in the year 1887.

The whole Yilgarn field seems to follow one anticlinal fold in the country, the centre of which is exposed at Golden Valley, where the reefs dip both East and West, where the country is hard and the stone carries much copper.

Hope's Hill and Southern Cross are on the Western side of this fold, while Blackborne's is on the other side of a synclinal still further West, where the reefs dip to the East. All along this line of country the stone is highly mineralised, containing carbonate of iron and chlorite.

In 1900 this field had a prosperous career; the gold yield of 29,155ozs., shows an increase, as compared with that for 1899, of about 78 per cent., though the average of ·53ozs. per ton of ore milled is low, mining costs are not excessive, and the field being comparatively close to the coasts freight charges are reasonable. The increase in the output of the field is chiefly accounted for by the treatment of accumulated tailings.

The increase for the previous year was not maintained during 1901, there being a decrease of 2,568ozs. in the gold yield of 26,587ozs. as compared with that for the previous year.

The following table shows the yield of the Yilgarn goldfield up to the close of 1901:—

Yield of the Yilgarn Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1889			1,858·50	1,662·61	*a.* Details not available.
1890			2,277·00	2,036·99	
1891			12,833·30	11,480·61	*b.* Details not available, but includes 738·18 ozs. dolled and specimens.
1892			21,209·49	18,973·91	
1893	*a*174,925·00	*b*94,194·60	75,744·55	67,760·73	
1894			31,498·38	28,178·31	
1895			19,747·75	17,666·25	
1896			16,565·25	14,819·20	
1897 ..	35,988·00	17,072·82	17,994·48	16,097·78	
1898 ..	27,807·35	11,769·40	11,696·18	10,463·35	
1899 ..	33,403·18	16,371·78	16,805·04	15,033·71	
1900 ..	54,403·10	29,155·42	29,418·10	26,317·30	
1901 ..	26,529·00	*c*26,587·41	29,488·07	26,727·00	*c.* Includes 23·18 ozs., dolled and specimens.
Total ..	353,055·63	195,151·43	287,136·09	257,217·75	

Digitized by Google

Government Photolithographer, Perth, W.A.

N.J. Fletcher.

Digitized by Google

Digitized by Google

Coolgardie Goldfield.

The Coolgardie Goldfield was proclaimed on the 6th April, 1894; its boundaries were amended by proclamation gazetted on the 20th March, 1896, taking effect from the 15th April of that year. It embraces an area of 11,974 square miles, and is defined by the authorities as being:—

Bounded by lines starting from the North-East corner of the Yilgarn Goldfield (which is a point about 50 miles West from a cairn marked NB1, near Wangine Soak), and extending South about 118 miles through a cairn H26 on Koorarawalye Granite Rock; thence East about 133 miles through the summit of a granite rock near the 50-Mile Soak, on the Dundas and Lake Lefroy Road; thence North about 48 miles to a point 35 miles East of the South-East corner of Hampton Plains Location 48; thence West 35 miles to the South-East corner of the above-mentioned Location; thence along the boundaries (surveyed) of Location 48, Westerly 443 chains 91 links, Northerly 564 chains 87 links to the South-East corner of Location 51; thence along the boundaries (surveyed) of that Location Westerly 160 chains, Southerly 60 chains, Westerly 119 chains 87 links to the South-West corner of Location 51; thence Northerly 400 chains along the Westerly boundary of Location 51, and the Eastern boundary of Location 53 to the North-East corner of Location 53; thence along a surveyed line 324° 16 36 miles 1,481 links; thence North 30 miles 47 chains 46 links along a surveyed line to a tree R3, near Cane Grass Swamp, on the 90-Mile Road; thence Westerly about 50 miles to the starting point.

Previous to 20th March, 1896, the Coolgardie Goldfield embraced the present Coolgardie, East Coolgardie, North-East Coolgardie, and Broad Arrow Goldfields, all of which, together with the present Yilgarn field, were originally known as the Yilgarn Goldfield.

Coolgardie Goldfield, as at present constituted, was officially declared on the 20th March, 1896, and, for purposes of administration, was eventually divided into the Coolgardie and Kunanalling Districts.

The geological features of this area are marked by a mass of intrusive granite on the West, succeeded by a belt of hornblende and talcose schists, the whole being intersected by dykes of both basic and acidic rocks. The acid eruptive rocks, which, as a rule, follow the strike of the schists, in all probability emanate from the main granite mass, as cases occur in which a gradual passage from the latter can be identified. Quartz reefs are often intimately associated with the acidic dykes, and in some cases the latter gradually pass into pure quartz at their extremities. As a rule, these quartz veins are non-auriferous.

The schistose rocks which are hornblendic, or occasionally talcose, seem to result from the surface weathering of amphibolites. The general strike varies from North 20° West and South 20° East to North 20° East and South 20° West, the dip being from 30° to 60° to the East; more rarely the beds dip West, but such is of local occurrence.

The diorites and andesites form both bosses and dykes, and are found invading both the granite and the schist.

Digitized by Google

In certain portions of the field, both the granite and schistose rocks are covered with a variable thickness of their own weathered *débris* and other superficial deposits. These superficial deposits extend over a very large portion of Coolgardie; they vary in thickness from a few inches up to several hundred feet, as in Rollo's Bore.

Ancient water channels exist in the vicinity of Coolgardie, about eight miles from the township; one of these has been pierced by a bore to a depth of 162 feet.

The gold obtained from Coolgardie has been derived from three principal sources, viz., alluvial deposits, lode formations, and quartz reefs. The gold from the recent superficial deposits presents all the usual characters. Unfortunately there are no data available by which the amount of alluvial gold obtained in the early days from the Coolgardie Goldfield can be deduced. The "lode formations," as a rule, consist of schistose rocks traversed by a network of quartz leaders; the formations appear to possess no sharply defined boundaries, unless in exceptional cases, the limits of the deposits being defined by purely technical considerations. A great deal of gold seems to have been derived from these formations; but, owing to the way the returns are supplied, it has not been possible to separate the yield of the formations from that of the quartz reefs proper. The quartz reefs trend generally North and South, and have a dip of from 60° to 80° to the East.

Many of the quartz reefs in the neighbourhood of Coolgardie stand up from the surface like walls of masonry, 15 or 20 feet high, having resisted the denuding action of the atmosphere better than the enclosing country rocks.

There are two distinct varieties of reefs, one closely resembling the lode formations and occurring in large lenticular patches, often forming pronounced outcrops on the surface, and the other of the true fissure type. Of the first class, the reefs on Bayley's Reward Claim, and the Big Blow Mining Lease, No. 35, are the best examples, whilst Sherlaw's Perseverance, and Burbank's Birthday Gift Mining Lease, No. 3252, are examples of the second class.

The output of this field for 1899 showed a substantial increase over that for 1898, but this increase was not maintained, and the yield for 1900 shows a falling off, as compared with 1899, of 28,844ozs. The number of men employed also decreased during 1900 by 808, but the number of ounces of gold produced per man employed increased from 48·07ozs. in 1899, to 57·34ozs. in 1900.

During the year 1901, it cannot, however, be said that much progress was made; the decrease in the yield for the year being 17 per cent. as compared with that for 1900.

Digitized by Google

The following table shows the yield of the field up to the close of 1901 :—

Yield of the Coolgardie Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1894			b105,329·82	94,227·58	a. Details not available.
1895	a33,352·45	a74,181·76	125,105·94	111,919·21	b. Included with Yilgarn prior to 5th April, 1894.
1896			69,135·19	61,848·03	
1897 ..	54,251·16	c 64,791·48	104,306·37	93,312·00	c. Includes 236·85 ozs. of alluvial.
1898 ..	107,622·39	d 99,672·84	127,227·06	113,816·75	d. Includes 52·71 ozs. of alluvial, and 1158·96 ozs. dollied and specimens.
1899 ..	155,003·14	e 131,256·89	141,170·08	126,290·11	e. Includes 6,476·40 ozs, of alluvial and 1713·54 ozs. dollied and specimens.
1900 ..	133,087·75	f 102,413·01	119,781·46	107,155·95	f. Includes 1624·76 ozs. of alluvial and 320·06 ozs. dollied and specimens.
1901 ..	121,675·91	g 84,754·03	88,600·54	80,304·56	g. Includes 1259·65 ozs. of alluvial and 1,739·76ozs. dollied and specimens.
Total	604,992·80	557,070·01	880,656·46	788,874·19	

Broad Arrow Goldfield.

The Broad Arrow Field, declared by proclamation gazetted on the 17th November, 1896, to take effect from the 20th of that month, embraces an area of 590 square miles, and is defined by the authorities as being :—

Bounded by lines starting from Survey Station R3; thence East about 17 miles 30 chains to a point North of the most Northerly corner of the East Coolgardie Goldfield; thence South about 29 miles 70 chains to that corner; thence about 234° 51′ 14½ miles to the 40-Mile post on part of the Eastern boundary of the Coolgardie Goldfield; thence about 324° 46′ 9 miles 32 chains 44 links; thence North 30 miles 47 chains 56 links to the starting point.

The geological features and mode of occurrence of the ore deposits of this field bear a strong similarity to those of Coolgardie.

The gold produced from this field has been derived from three sources, viz., alluvial deposits, lode formations, and quartz reefs The gold from the alluvial deposits presents all the usual characters The lodes, so far as observations have been carried, are usually banded, and practically distinguishable from the country rock only by their auriferous character. The quartz reefs, which invariably occur in

Digitized by Google

intimate association with the acid eruptive dykes, are of two distinct varieties. The first occur as lenticular patches, from which small quartz veins emanate in all directions. These branching veins appear to be richer. The second type are those banded rocks which consist of alternating layers of crypto-crystalline quartz and hematite. The proportion of oxides of iron varies from a practically pure hematite to a quartz rock, through which such small quantities of hematite are disseminated as to give it a brown or bluish appearance. These banded rocks seem to have been permeated with secondary silica, which has also penetrated the surrounding rocks. Although these banded quartzites have proved auriferous, none of them have so far shown themselves to be payable; in the circumstances that these banded quartz rocks are a possible source of gold, they are identical with the quartzites of Peak Hill (to which reference has been made on an earlier page) and of Mount Margaret.

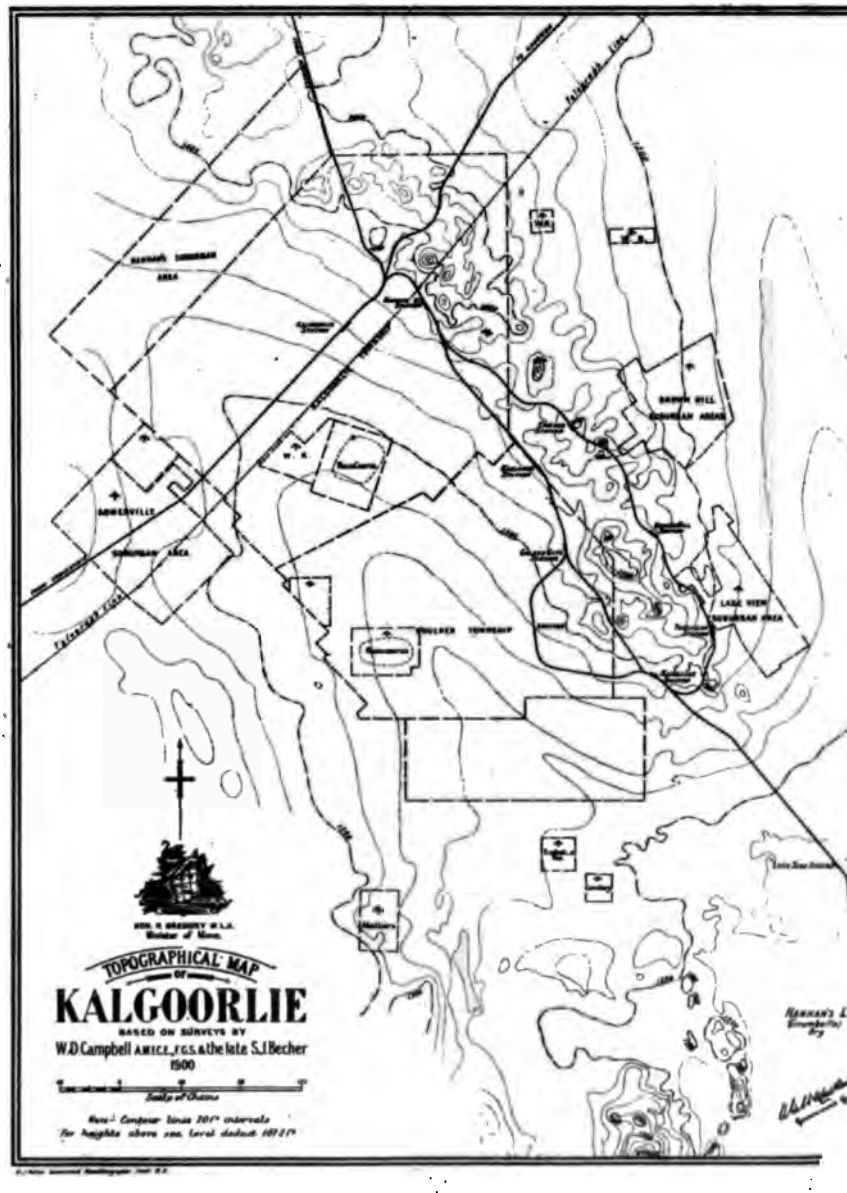
The yield of 52,433ozs. for the year 1900 shows an increase of about 9 per cent., as compared with 1899, though this is due to the increase in the output of several mines rather than to an increase in the number of producing mines. The results of the operations for the year 1901 show a large falling off in the gold output, the decrease of yield being 34 per cent. as compared with the yield of the previous year.

The following table shows the yield of the field up to the close of 1901 :—

Yield of the Broad Arrow Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1896 ..	*a*1,536·20	*a*8,879·25	..	..	*a*. Complete details not available.
1897 ..	19,636·30	*b*14,464·54	*g*4,159·27	3,720·87	*b*. Includes 27·20 ozs. dollied and specimens.
1898 ..	32,004·06	*c*27,726·43	24,631·44	22,035·17	*c*. Includes 1,483·59 ozs. of alluvial, and 270·42ozs. dollied and specimens.
1899 ..	59,976·40	*d*48,194·38	44,524·29	39,831·22	*d*. 114·21 ozs. of alluvial and 197·93 ozs., dollied and pecimens.
1900 ..	73,493·17	*e*52,433·32	47,860·59	42,815·87	*e*. Includes 1,470·26 ozs. of alluvial and 268·44 ozs. dollied and specimens.
1901 ..	44,740·13	*f*34,675·44	29,104·78	26,379·59	*f*. Includes 1,229·52 ozs. of alluvial and 161·30 ozs., dollied and specimens.
Total ..	231,386·36	186,373·36	150,280·37	134,782·72	*g*. No details available prior to 1st September, 1897.

Digitized by Google



Digitized by Google

Digitized by Google

East Coolgardie Goldfield.

This comparatively small field, the most productive in Australia, embraces an area of 632 square miles. It was declared by proclamation gazetted on the 21st September, 1894, to take effect from the 1st October of that year; its boundaries were amended by proclamation gazetted on the 20th March, 1896, to take effect from the 15th April following. It is defined by the authorities as being :—

Bounded by lines starting from a mile-post on the Eastern boundary of the Coolgardie Goldfield, 40 miles Southerly from Survey Station R3, and extending 144° 46′ 26 miles 62 chains 37 links along a surveyed line to the North-East corner of Location 53; thence Southerly along the Eastern boundary of Location 53 and the Western boundary of Location 51 to the South-West corner of Location 51; thence along the boundaries of that Location Easterly 119 chains 87 links, Northerly 60 chains, Easterly 160 chains to a point on the Western boundaries of Location 48, Southerly 564 chains 87 links, Easterly 443 chains 91 links to the South-East corner of that Location; thence Easterly about 7 miles 65 chains to a point South of the South-East corner of Location 45; thence North to the said corner; thence North along the Eastern boundary of Location 45, 4 miles, to its North-East corner; thence about 342° 10′ about 1 mile 64 chains to the South-East corner of Location 44; thence along the Eastern boundary of Location 44 to its North-East corner; thence 321° 35′ about 30 miles 53 chains to a point bearing about 54° 50′ from the 40-Mile post on the Eastern boundary of the Coolgardie Goldfield; thence about 234° 50′ about 14½ miles to the starting point.

Kalgoorlie, the official centre of the East Coolgardie Goldfield, the most productive field in Australasia or the British Colonies, was in the first instance called Hannan's, after Patrick Hannan, the original discoverer of the field.

The principal topographical feature of the field consists of a low broken Range, of which Mount Charlotte, 1,378 feet above sea-level, forms the highest summit, and which trends generally North-North-West from the head of Hannan's Lake. This line of comparatively low hills diminishes in altitude from Mount Charlotte to a mere ridge, which gradually merges into the flat ground surrounding the lake, and forms the main water-parting of the district. To the Eastward, the country extends in a wide, gently-sloping valley, with a Southerly fall, flanked by a line of low hills, some six or seven miles distant; to the Westward again is another valley of about two miles in width.

By far the larger portion of the field is covered with a mantle of reddish loamy soil, and other superficial accumulations of variable thickness. These superficial deposits consist of ironstone gravels and cement, passing in certain isolated localities into practically pure brown hematite. Some of the surface deposits have proved to be highly auriferous in places.

The rocks of the field consist of :—

(1.) Amphibolites and other derivatives, including most of the lode stuff.

(2.) New eruptives, both acid, intermediate, and ultra-basic.

(3.) Sedimentary rocks

Digitized by Google

The amphibolites which form not only the country rocks of the productive ore-bodies of Kalgoorlie, but also, in a much altered form, the greater number of the "lode formations" themselves, possess the highest interest. Owing to the varying and sometimes extreme alteration that they have undergone, the rocks present an almost endless variety of form and (within certain limits) composition. They appear to resemble very closely the greenstone schists of the South shore of Lake Superior, North America, which are associated with important deposits of iron ore. The Kalgoorlie amphibolite rocks are of four main types, viz., massive and foliated amphibolites, massive and foliated greenstones (chlorite-rock), chlorite schist, and massive and foliated siderite-rock.

The minerals which have been recognised in these rocks are hornblende, plagioclase, orthoclase, quartz, limenite, and magnetite, all of which may be original constituents, or wholly or partially secondary, together with the undoubtedly secondary minerals chlorite, epidote, zoisite, sericite, leucoxene, rutile, calcite, dolomite, siderite, and pyrites, with occasionally lollingite, gold, etc.

All the amphibolites and other derivatives are portions of the one mass, and have originally been one and the same. No remnants of that original rock being left unaltered, its exact nature cannot be determined. That it was an igneous rock appears certain from the presence of ilmenite, hornblende, and areas of micropegmatite, and from the absence of fossils or water-worn inclusions. It may have been a diabase or plagioclase-augite rock. The original rock has been metamorphosed in three ways: By molecular rearrangement, with the production of secondary hornblende; mechanically, many of the minerals being fractured or crushed, and more or less foliation set up; chemically, by the absorption of water, carbonic acid, sulphur, etc., resulting in a complete destruction of original minerals and the formation of secondary chlorite, calcite, quartz, etc. The so-called "lode formations" are in most cases merely bands of this igneous rock which have been permeated by solutions of the precious metals.

Traversing the main mass of amphibolite and older sediments are several intrusive masses of felspar-porphyry, porphyrite, and peridotite.

Surrounded on all sides by the igneous rocks, and dipping at a high angle, are a series of sedimentary rocks, ranging on the one hand from a soft shale to a jasperoid slate, and on the other from a sandstone to a flinty quartzite. The effect of metamorphism on these rocks has been as varying in its intensity as on the amphibolites. Soft grey shales and ironstones pass into fine grey or graphitic slates, in which secondary sillicification has sometimes gone on up to the point of converting the rock into an opaque banded jasper. Graphite to the extent of 5 per cent., or more, is a frequent constituent in the

Digitized by Google

slates. It may owe its origin to the alteration of organic matter originally existant in the rocks, or to the subsequent intrusion of vapours of hydrocarbons into the beds. A peculiar feature of the graphitic slates are spherical nodules of pyrites from ⅛ inch up to an inch or more in diameter, which are frequently enclosed in them.

Of siliceous sediments, soft sandstones are of rare occurrence, but narrow bands of sandy material do occur with the shales. Flinty quartzite is of frequent occurrence, ranging in composition from almost pure silica to various mixtures of quartz, clay, and iron oxides, the latter, however, being seldom found in notable quantities.

Breccias occur in several parts of the field.

The newer sediments are of two kinds, chemical and mechanical. The former includes salt, traverline, siliceous sinite, and laterite; the latter, sand clay, and ironstone gravel.

The lodes of Kalgoorlie consist of a series of almost vertical banded schistose formations (merely country rock more or less altered by dynamic changes), which have a general trend of from North 30° West to North 50° West. These deposits are lenticular in habit, the lenses being often of great length. Instances occur which go to prove that some of these may reach over half a mile in length. At times, however, the lateral continuity of the lenses is interrupted by faults of very variable downthrow. As a general rule the ore deposits have no well-defined walls, but seem to pass insensibly into the surrounding rock. The lodes are often traversed by a network of quartz veins, which ramify in all directions. There is abundant evidence attesting the fact that the rocks have been subjected to profound dynamic phenomena, which has resulted in the production of lines of weakness along which mineral-bearing solutions have found a comparatively easy passage. The width of the ore bodies reaches as much as 80 feet in places. The gold occurs free as tellurides and as auriferous pyrrhotite. The free gold presents such characters as point to its having been derived from the oxidation of the tellurium-bearing minerals; the decomposition of the auriferous pyrites may also be the source of some portion of it. The free gold often occurs in spongy or cellular masses of varying sizes and shapes, and is at times coated with a dull clayey ferruginous material of a yellow colour, known as "mustard-gold," which may represent an oxidised form of tellurium. The tellurides of gold occur chiefly as Calaverite. The yield of the goldfield for the year 1900 was 737,971ozs., which, as compared with that of the previous year, shows a falling off of about 14 per cent.; in spite of this, East Coolgardie has produced 48¾ per cent. of the total yield of the State, and almost as much as the combined yields of New South Wales, New Zealand, South Australia, and the Northern Territory. The average per ton of ore treated during 1900, was 1·49 ozs. per ton, against 1·83ozs. in 1899. During 1901 the total reported gold yield was 991,369ozs., or 34 per cent. more than the

Digitized by Google

previous year, and 53·84 per cent. of the total reported yield of the State; the average yield per ton of ore milled being practically the same as for the previous year, viz., 1·42 ozs., against 1·49 ozs. for 1900.

The following table shows the yield of the East Coolgardie Goldfield up to the close of 1901 :—

Yield of the East Coolgardie Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1896	47,026·34	143,328·70	f85,287·06	76,297·42	a. Includes 46·15ozs. of dollied and specimens.
1897	117,565·72	a296,764·11	300,037·24	268,411·95	b. Includes 148ozs. of dollied and specimens.
1898	264,324·76	b422,391·86	450,312·27	402,847·31	c. Includes 590·25 ozs. of alluvial and 29·56ozs. dollied and specimens.
1899	466,759·09	c855,404·87	923,617·70	826,264·21	d. Includes 2,295·56 ozs. of alluvial and 2,019·24ozs. dollied and specimens.
1900	491,720·00	d737,970·98	810,906·78	725,433·53	e. Includes 1,331ozs. of alluvial and 1,247·85ozs. dollied and specimens.
1901	693,799·73	e991,368·60	1,033,669·64	936,883·49	f. Included with Coolgardie prior to 1st May, 1896.
Total	2,061,195·64	3,447,229·12	3,603,830·69	3,236,127·91	

North-East Coolgardie Goldfield.

This Goldfield was declared by proclamation gazetted on the 20th March, 1896, to take effect from the 15th April of that year; its boundaries were amended during the same year by proclamation gazetted on the 13th November, to take effect from the 20th of the same month. It embraces an area of 21,542 square miles, and, according to the authorities, it is comprised by—

Lines starting from a point situate about 17 miles 30 chains East of Survey Station R 3; thence South about 29 miles 70 chains to the most Northerly corner of the East Coolgardie Goldfield; thence about 141° 35′ about 30 miles 53 chains to the North-East corner of Location 44; thence along the Eastern boundary of that location to its South-East corner; thence about 162° 10′ about 1 mile 64 chains to the North-East corner of Location 45; thence along the Eastern boundary of that Location to its South-East corner; thence South to a point 7 miles 65 chains East from the South-East corner of Location 48; thence East about 27 miles 15 chains; thence South about 48 miles to the South-East corner of the Coolgardie Goldfield; thence East to the 125th meridian of East longitude; thence North along that meridian to a point East of Survey Station R 3 aforesaid; thence West to the starting point.

Digitized by Google

For administrative purposes, the field is divided into three districts :—Kanowna (White Feather), Bulong (I.O.U.), and Kurnalpi.

Kanowna.—The fundamental rocks of the Kanowna district are chlorite, talcose, and serpentinous schists, invaded by dykes of acid eruptive rocks, which have a prevailing North-Easterly strike and an Easterly dip. The schists, so far as has been disclosed by mining operations, are all in an advanced stage of decomposition. They have proved to be highly auriferous in places. The granitic rocks which contain gold in appreciable quantity are reticulated by interlacing quartz veins, which are also auriferous ; these appear to have been prospected with considerable success.

Considerable interest, however, at Kanowna attaches to the alluvial leads, which have been extensively worked. The most prominent of these is the North Lead, which lies in a natural depression which has been traced from the Cemetery to G.M.L. 918. The North Lead lies in an old watercourse carved out of the older rocks, and has been proved to be not merely a simple isolated run of auriferous gravel, but part of a series of old stream deposits, which took their rise in the comparatively elevated ground to the East and flowed in a general Westerly direction.

The lead trends generally Northwards as far as the G.M.L. 923, when its course is suddenly deflected to the East. It is joined near the Birthday Gift Claim by what is known as Wilson's Gully Lead, which enters from the South. Some distance below the junction the North Lead loses itself in an extensive flat, which may prove to be merely a lake-like expansion of its channel. The connection of the Q.E.D. Lead on the North, although it trends in such a direction as to fall into the North Lead, has not yet been definitely proved. All things point to such a connection, though it may be that the lead has been lost by denudation.

The width of the old stream varies from two to 80 feet, having an average, according to departmental observations, of about 15 feet. The thickness of the deposit in the old channel varies from a few inches up to as much as 90 feet. The fall of the lead is about at the rate of 40 feet to the mile.

The deposits filling the old watercourse naturally vary somewhat in different portions. They consist first of a variable thickness of surface loam, etc., succeeded by ironstone gravels partially cemented in places by kaolin and oxide of iron into solid rock. Beneath this lies a bed or beds of practically pure kaolin (" pug "), and a varying thickness of a pebbly quartz wash. The wash contains rounded and subangular pebbles of quartz, which, in the upper portion of the deposit, is often associated with kaolin and sand. This quartz wash is cemented by secondary silica into a hard, compact rock, which, in hand specimens, might easily be mistaken for quartzite.

Digitized by Google

So far as mining operations have, up to the present, been carried out, it would seem that the whole of the detrital deposits have not proved auriferous. Most of the alluvial gold has been won from the pebbly quartz wash, although the overlying kaolin ("pug") and ironstone gravels have also yielded a certain quantity.

The ultimate derivation of the gold in the North Lead is from the quartz veins and lodes (upon which the wash directly reposes in places) by which the crystalline rocks are traversed; for the gold is not exclusively in the form of grains, scales, etc., but is found occurring in the quartz pebbles themselves.

In addition to what may be called detrital gold, there is another massive, arborescent, or coarsely crystalline form which occurs, filling certain irregular cracks, and covering cleavage planes or shrinkage cracks so as to present the appearance of painted surfaces.

The mode of occurrence, associations, and character of this gold all point to a secondary origin; and it is of importance to note that this, what may be called secondary gold, has been deposited from solution, not only in the alluvium and other superficial deposits, but also in the zone of decomposition of the bed-rock. These secondary forms, which result in the superficial enrichment of many auriferous deposits, are a common feature in the mineral fields of the State.

Of the age of the North Lead there is no evidence available at the present time. Owing to the fact that at a date subsequent to its formation a sufficient length of time has elapsed to allow of the lead being sealed up by great accumulations of superficial deposits (some of which have been consolidated into solid rock) may point to considerable geological antiquity.

There are no data available by which the average fineness of the gold from the North Lead can be obtained.

That many other similar leads probably exist is obvious from the geological structure of the district, though, owing to the completeness by which they have been sealed up by the more recent accumulations, they can only be tapped by a judicious system of prospecting.

It is impossible to arrive at the gold yield of the portion of Kanowna traversed by the old watercourse, owing to there being no separate returns furnished by the claimholders on the North Lead The returns. which are appended, show that up to the end of 1901 the lodes from Kanowna yielded 132,405·22ozs. of gold by crushing 154,585·95 tons of ore. The alluvial deposits, the gravels, yielded 108,332·47ozs. of gold, and 105,768·92 tons of cement crushed were responsible for 113,631·11ozs. From these data it will be seen that the alluvial deposits turned out 62 per cent. of the total production.

Digitized by Google

Tables showing the Gold Production of Kanowna.

I.—Lodes.

Year.	Ore Crushed.	Total Yield.	Rate per ton.
	tons.	ozs.	ozs.
Previous to 1898 ..	27,365·55	28,243·77	1·03
1898	24,838·10	20,892·00	·83
1899	20,735·50	19,680·02	·94
1900	43,573·05	29,674·01	·68
1901	38,073·75	33,915·42	·89
Total	154,585·95	132,405·22	·85

II.—Alluvial Deposits.

(a.)—*Gravel.*

Previous to 1898 ..	..	10,611·92	..
1898	..	63,548·02	..
1899	..	19,462·29	..
1900	..	8,931·83	..
1901	..	5,778·41	..
Total	..	108,332·47	..

(b.)—*Cement.*

Previous to 1898 ..	*	*	
1898	45,983·22	68,183·54	1·48
1899	41,429·95	35,494·31	·85
1900	15,870·00	8,776·82	.55
1901	2,485·75	1,176·44	.47
Total	105,768·92	113,631·11	1·07

Bulong.—The Bulong, or I.O.U., Mining District never has been the subject of geological examination, so that the information is far from complete. The country rock is described by S. Göczel, a former member of the staff, as being partly diorite and partly diabase, both having been much subject to decomposition. A large North and South reef is said to form an important feature; two miles to the West of this is a stretch of country, about two miles long, in which several gold-bearing lodes occur.

On the ground held by the Mystery Gold Mining Company, large quantities of gold have been obtained from the superficial covering of a ferruginous deposit (laterite) which covers such extensive areas in the State. The deposit is described as a gritty limonite, interbedded with clayey ironstone.

Digitized by Google

The alluvial deposits of Bulong, some of which have been worked at a depth of over 100 feet, yielded, up to the close of 1901, 22,437·50ozs. of gold. Several leads have been worked, but as they have never been geologically mapped, details in connection with them are wanting.

Kurnalpi.—Of the Kurnalpi District practically no information is available. The alluvial deposits, however, yielded up to the close of 1901, 10,350·54ozs. of gold.

The output of this goldfield, which has produced so much gold in the past, showed a substantial decrease during the year 1900; comparing the yield for 1900 with that of 1899, the former shows a decrease of 37 per cent. During 1901 this field shows a further decrease in the output.

The following table shows the yield of gold up to the close of 1901 :—

Yield of the North-East Coolgardie Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1896 ..	5,682·30	*a* 8,975·95	*g* 4,113·18	3,679·63	*a*. Includes 150ozs. dollied and specimens.
1897 ..	28,546·25	*b* 40,453·10	32,905·82	29,437·40	*b*. Includes 10,917·95 ozs. of alluvial and 886.23 ozs. dollied and specimens.
1898 ..	80,095·83	*c* 170,441·73	125,240·49	112,039·58	*c*. Includes 69,069·76 ozs. of alluvial and 1,115·57ozs. dollied and specimens.
1899 ..	82,716·30	*d* 112,825·45	81,171·18	72,615·37	*d*. Includes 34,527·80 ozs. of alluvial and 1,648·87ozs. dollied and specimens.
1900 ..	70,713·05	*e* 70,745·86	52,129·12	46,634·47	*e*. Includes 16,099·57 ozs. of alluvial and 4,623·54ozs. dollied and specimens.
1901 ..	51,978·25	*f* 63,651·70	50,556·53	45,822·74	*f*. Includes 10,498·93 ozs. of alluvial and 3,595·71ozs. dollied and specimens.
Total ..	319,731·98	467,093·79	346,116·32	310,229·19	*g*. Prior to 1st May, 1896, included with Coolgardie.

Digitized by Google

DUNDAS GOLDFIELD.

This field, the most Southerly of the Eastern fields, was proclaimed on the 31st August, 1893, its boundaries being subsequently amended by proclamation gazetted on the 20th March, 1896, to take effect from the 15th April of that year. It embraces an area of 17,848 square miles, which, according to the authorities, is—

Bounded on the North by an East and West line passing through the summit of a granite rock near the 50-Mile Soak, on the Dundas and Lake Lefroy Road; on the East by a North and South line through a point 52 miles East of Mount Ridley; on the South by an East and West line passing through the summit of Mount Ridley; on the West by the production South of the Western boundary of the Coolgardie Goldfield.

Although the area proclaimed as a goldfield is of considerable extent, the actual portion over which gold has been discovered is small, and seems to be confined to the Dundas Range and its Northern extension; or, in other words, the belt of land that lies between Lake Cowan and Lake Dundas.

Gold was first discovered in the year 1892, at the Southern end of the Dundas Range; but as the reefs did not prove to be very rich, little mining is being carried on at that locality at the present time.

It seems that Mr. Moir, of Fanny's Cove, was the first to detect gold in the country now embraced by this field. The discovery was made in the alluvium of one of the creeks when this gentleman was engaged in searching for pastoral lands. No effort would appear to have been made to give further attention to the district until some years later, when Mr. Moir organised a prospecting patry, which, however, was not successful. About the same time further prospecting was carried out by other parties, which resulted in the discovery of a rich reef called the "May Bell" and another called the "Scotia."

The rocks of the gold-bearing belt are similar to those of the Coolgardie district, and, like that locality, the richest lodes are situated in the contact zone, upon the Eastern side of the granite. The belt is dislocated and considerably disturbed in places by the intrusion of large diorite dykes, which rise as rough, reddish, black hills here and there, running in an almost East and West direction.

There are about three distinct main lines of auriferous lodes, most of which dip at an angle of about 45° and vary considerably in size and richness. The output of gold from the field for the year 1900 shows a decrease of about 7 per cent. as compared with that for 1899. The average yield per ton of ore treated was more than maintained, it being ·83oz., as against ·74oz. in 1899.

During 1901 mining operations proved quiet, and a decrease of 4,000ozs., or about 10 per cent. on the previous year's output, is to be recorded. The average per ton of ore milled rose from ·83 to ·94ozs.

Digitized by Google

The following table shows the gold yield of Dundas up to the close of 1901 :—

Yield of the Dundas Goldfield.

Year.	Ore crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1893			g147·07	132·37	a. Details not available.
1894	a2,923·00	a3,979·90	228·38	204·31	b. Includes 77·50 ozs. dollied and specimens.
1895			241·90	216·40	c. Includes 5·60ozs. of dollied and specimens.
1896			4,350·31	3,891·77	d. Includes 142·75 ozs. of alluvial and 146·18ozs. dollied and specimens.
1897 ..	16,979·98	b19,283·52	19,310·81	17,275·36	
1898 ..	30,928·35	c36,798·48	32,031·82	28,655·52	e. Includes 116·13 ozs. of alluvial and 35·48ozs. dollied and specimens.
1899 ..	59,379·30	d44,213·30	45,164·95	40,404·36	
1900 ..	49,014·50	e41,083·63	40,687·56	36,398·91	f. Includes 623·82 ozs. of alluvial and 180·05ozs. dollied and specimens.
1901 ..	38,373·00	f37,084·09	38,796·25	35,163·62	
Total ..	197,598·13	182,442·92	180,959·95	162,342·62	g. Prior to 1893 included with Yilgarn.

Donnybrook Goldfield.

This little Goldfield is situated between Geographe Bay and the Greenbushes Tinfield. It was declared by proclamation gazetted on the 17th November, 1899, to take effect from the 27th of that month, and comprises an area of 102 square miles. The authorities define its boundaries as follows :—

Starting from the South-Western corner of Reserve 6321 (Covenley Townsite); thence North about 60 chains to the Boyanup-Bridgetown Railway Reserve: thence by the Western boundary of said Railway Reserve in a general North-Westerly direction about 14¼ miles to its intersection with the Eastern boundary of Wellington Location 239; thence North about 10 chains to the left bank of the Preston River; thence by said River in a general North-Easterly direction about 2¼ miles to the North-Eastern corner of Reserve 645A; thence North about 3 miles; thence West about 7 miles to the Eastern boundary of Boyanup-Bridgetown Railway Reserve; thence by said Railway Reserve in a general South-Easterly direction about 3¾ miles to a point North of North-West corner of Wellington Location 836; thence South about 13¼ miles; thence East about 9¼ miles to the point of commencement.

Donnybrook is situated on the Bunbury and Bridgetown Railway, and is 26 miles South-East of Bunbury and 131 miles by rail from Perth. The scene of mining operations is some two miles to the South of the Donnybrook townsite, on a small branch of the Preston River, in the Blackwood Range. Gold would seem to have been first discovered in 1897, by a party of prospectors searching for alluvial

Digitized by Google

gold. Further investigations carried on eventually led to the discovery of auriferous quartz veins, from which most of the gold had originally been shed.

The country rocks of the field consist of massive hornblende and gneissic granites intersected by a belt of hornblende rock trending North and South, and traceable for some considerable distance in a Southerly direction. The width of the belt of dioritic rock varies from a quarter of a mile, though it has never been found to exceed a mile. In hand specimens the rock is found to consist of coarse hornblende crystals associated with more or less decomposed felspars. The Western edge of the dyke has a banded structure, and resembles hornblende schist; in isolated cases it is found occurring as an exceedingly fine-grained and exceptionally hard rock. The granite naturally varies considerably in texture and composition, though, as a whole, it is a hornblende granite. In several localities the hornblende is almost entirely replaced by muscovite mica. Epidote is found occurring as a rock-forming mineral in the granite. Recent developments have shown the existence of extensive deposits of sandstone lying beneath the ubiquitous ironstone gravels. These sandstones, which are usually of a light grey colour, are fine-grained and of an even texture. The maximum thickness attained by the sandstone is not less than 150 feet.

The quartz reefs all occur in the granite to the West of the diorite, always in close proximity to the junction of the two rocks. The general strike of the reefs is a little to the West of North and East of South, with a high dip to the East. Mining operations have shown that payable quartz reefs occur in the sandstone as well as in the unaltered granite.

Some of the gold from Donnybrook occurs in the filmy arborescent form, which points to a secondary origin.

During 1900 the gold yield of Donnybrook was merely nominal, only 453ozs. having been produced, and during the year 1901 the output was much less, only 3·86ozs. having been reported to the Mines Department.

The following table shows the yield of the field since 1898:—

Yield of the Donnybrook Goldfield.

Gold.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1898	18·00	14.65	*b*	*b*	*a*. Includes 32·10 ozs. of alluvial. *b*. No details available prior to 1st March, 1898.
1899	294·80	*a*511·49	506·11	452·76	
1900	360·00	453·10	265·55	237·56	
1901	48·50	3·86	4·64	4·20	
Total ..	721·30	983·10	776·30	694·52	

Digitized by Google

PHILLIPS RIVER GOLDFIELD.

The discovery of gold-bearing reefs in the Phillips River Mining District led to its being declared a Goldfield in September, 1900, the proclamation being gazetted on the 21st, to take effect from the 14th of that month. As officially declared, it embraces an area of 1,300 square miles, circumscribed by,—

The portion of Crown lands contained in the area starting from a point on the South Coast, distant about two miles Northerly from Red Island; thence due North through Mt. Madden about 45¾ miles; thence due East and by the Southern boundary of the Dundas Goldfield, 30 miles; thence due South about 41½ miles to the Coast; thence by the Coast to the starting point.

Here, like all along the Southern coast, a great disturbance has taken place in long bygone geological ages, by which the main strike of the metalliferous series has been thrown into a more or less Easterly and Westerly direction by a great granite intrusion, but unlike most of this coast, the mineral-bearing series approach the coast more nearly, the granite only appearing as reefs upon the beach and out at sea, although they probably extend for about ten miles inland beneath the recent coastal sandstones and limestones to the Northward of Hopetoun.

A few miles to the Westward of Hopetoun a bold rock mass rises abruptly called "East Mount Barren"; this is the Eastern end of a range which runs along the coast for a distance of about 40 miles, the rocks of which consist of hard highly crystallised rocks and quartzites, being destitute of metalliferous mineral veins.

From the Eastern end of this range is a low semicircular range of schistose rocks, with large pink quartz reefs traversed by numerous porphyritic dykes, having a well-defined North-West and South-East course, whilst diorite dykes are of less frequent occurrence. These rocks, to judge from their weathered surface, are hornblende and mica-schists with veins of dolomitic limestone, the latter having probably furnished the magnesian limestone with which the fragments of the rocks are incrusted. This series, so far, has not proved to be metalliferous. In the Phillips River basin a marked change in the nature of the country is at once apparent, not so much from the rocks themselves, since they rarely outcrop, but from the soils which result from their decomposition. Upon sinking, these rocks prove to be hornblendic and mica-schists, similar to those of the Northern goldfields, with granite and feldspathic dykes, the latter of which are often garnetiferous, whilst diorite dykes are abundant, and are of considerable extent and size, having apparently exercised a direct influence upon the formation of the mineral veins which occur in this series.

The Ravensthorpe Range itself consists more of the granitic series, being capped by ferruginous sandstones, and is untraversed by diorite dykes or mineral veins; the only dislocation being at the gap where it takes its turn South-East at the apex of the diorite intrusion.

Of the dykes, the granite (locally called "mica bars") are the most recent, for they often cut through the lodes, whilst probably the

Digitized by Google

diorite are next, since the felstones, with their associated copper lodes, seem to have been dislocated at the same time as the range.

The lodes may be divided into two classes—those in which copper is of the greater intrinsic value, and those in which gold is. The first of these have been opened upon at three different parts of the field, viz., Ravensthorpe, Mt. Desmond, and Harbour View.

The Ravensthorpe belt of copper lodes strikes in an East-North-East and West-South-Westerly direction from the North-West corner of the township, and extends for a distance of five miles; it consists of two groups, the first or central lies to the North of the township, and extends continuously for a distance of two miles, after which there is a gap of one and a-half miles, and then the Eastern group of leases for a distance of one and a-half miles.

Three miles in a West-South-Westerly direction from the Westernmost lease of the central group are three large mineral leases, which may be called the Western group, upon which the earliest discoveries of mineral upon this field were made; these are possibly upon the same belt, but no definite statement can be made since lines of rock outcrop cannot be traced, owing to the thickness of the superficial deposits; prospecting is therefore rendered difficult, and the presence of reefs and lodes only determined by small fragments upon the surface. This, it may be remarked, is the general characteristic in the Ravensthorpe District of both gold and copper lodes, whilst further it is not at all exceptional to discover, after finding fragments of lode matter upon the surface, that some four to six feet of clay, destitute of stone, has to be passed through before the cap of the lode is encountered.

Although this belt has a general direction East-North-East and West-South-West, the individual lodes, as a rule, strike almost East and West, or a few degrees North of East and South of West with a general Northerly dip; the exception being in some few lodes which dip to the Southward.

The following table shows the yield of the Phillips River Goldfield:—

Yield of the Phillips River Goldfield.

Year.	Ore Crushed.	Yield of Gold therefrom.	Gold Exported and received at Perth Mint.		Remarks.
			Gross Weight.	Fine Contents.	
	tons.	ozs.	ozs.	ozs.	
1900	..	a39·00	..	..	a. Dollied and specimens.
1901	192·00	b712·84	..	..	b. Includes 478·11 ozs. dollied and specimens.
Total ..	192·00	751·84	..	..	

Digitized by Google

COPPER.

Copper ores are plentifully distributed throughout the State, more especially in the North-West; but, owing to the fact that they usually carry little or no gold or silver, have only been worked in a few localities, notably—Tambourah, Pilbara District; Whim Creek, Egina, Hong Kong, Croydon, Roebourne, all in the West Pilbara District: Red Hill, and Uaroo, in the North-West District; Day Dawn, Murchison District; Geraldine, Northampton, Yandanooka, and Arrino, all in the South-West District; Murrin Murrin, Mount Margaret District; Muline, North Coolgardie District; Arrow Lake, Broad Arrow District; Boorara, East Coolgardie District; Ravensthorpe, Harbour View, Phillips River District.

Very little has been done in the examination of the copper deposits of the State, but so far they seem to be of two kinds, viz:—

(1.) True lodes.
(2.) Impregnations and stockworks.

(1.) *True Lodes.*—To this class apparently belong the majority of the workable deposits.

(2.) *Impregnations and Stockworks.*—The most important deposits of this class appear to be found in the Yandanooka Mineral District, where there are several beds of mica schist and porous sandstone carrying malachite, with occasionally a little azurite or cuprite. The ores average 10 to 12 per cent., are highly siliceous, and are not apparently readily concentrated. The copper minerals occur both as the cementing material of the rock and also in stockworks.

At Kalgoorlie bournonite, enargite, and chalcopyrite occasionally occur in the lode-formation below water-level, whilst malachite was observed in one instance in the oxidised ore.

The value of the copper ore reported to the Mines Department as obtained during the year 1900 was £43,673, showing an increase of £7,735 over the previous year.

During 1901 there was a large increase in the output of copper in the State, amounting to 3,974 tons more than was obtained during the previous year, the estimated value of the ore raised being £75,246.

The following table shows the quantity of copper ore raised, as reported to the Mines Department:—

Year.	Ore Raised.	Value thereof.
	tons.	£
Previous to 1899	7,018	55,270
1899	2,823	33,816
1900	6,178	43,582
1901	10,107	74,893
Total	**26,127**	**207,561**

Digitized by Google

These figures, however, by no means represent the total output since the inception of active mining operations.

The nearest approach to the total output of the State can only be obtained by the Customs records, and is shown in the following table :—

The Export of Copper Ore from Western Australia.

Year.	Ore Exported.	Value of Ore.
	tons.	£
1853	*a*	7·50
1855	2·05	26·45
1856	57·00	1,017·90
1857	80·00	1,920·00
1858	433·25	9,531·50
1859	941·50	14,122·50
1860	517·50	8,021·25
1861	409·00	6,339·50
1862	783·50	12,536·00
1863	763·00	12,208·00
1864	1,076·00	17,216·00
1865	886·00	13,290·00
1866	557·50	8,362·50
1867	337·00	5,055·00
1868	83·00	1,245·00
1869	155·00	2,325·00
1870	6·00	90·00
1871	..	..
1872	..	..
1873	56·50	847·50
1874	66·50	997·50
1875	204·75	3,071·25
1876	279·00	4,185·00
1877	53·50	802·50
1878	9·00	135·00
1879	..	..
1880	8·00	120·00
1881	..	..
1882	1·50	22·50
1883	5·00	75·00
1884	118·00	1,770·00
1885	119·50	1,792·50
1886	249·00	3,735·00
1887	23·00	345·00
1888	87·50	1,487·50
1889	112·00	1,904·00
1890	8·00	136·00
1891	262·50	4,462·50
1892	567·00	8,696·00
1893	50·00	606·00
1894	..	..
1895	826·00	12,952·00
1896	6·30	100·00
1897	86·00	1,033·25
1898	355·40	4,265·50
1899	1,991·05	41,451·75
1900	846·11	16,462·00
1901	2,660·25	54,903·00
Total	**16,138·66**	**279,672·35**

a Declared weight not stated.

Digitized by Google

The following table shows the export of Copper Ingots from the State since 1900:—

Year.	Ingots Exported.	Value thereof.
	tons.	£
1900	248·90	17,475·00
1901	880·50	55,866·00
Total	1,129·40	73,341·00

LEAD.

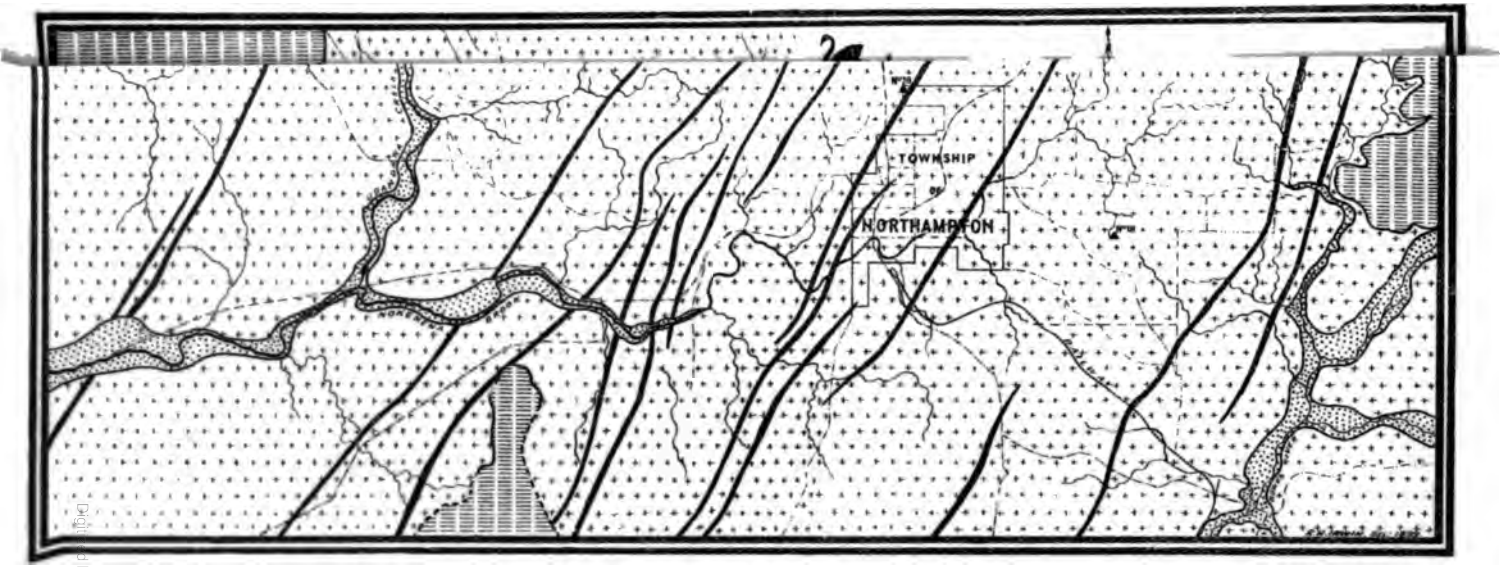
The commercially important lead ores of the State are to a large extent closely associated with copper ores, as, for example, in the Northampton district. The lodes are mainly composed of cerussite (carbonate of lead, $PbCO_3$) at the surface and galena (sulphide of lead, PbS) below the water-level, accompanied by more or less quartz and other gangue minerals. Anglesite (sulphate of lead, $PbSO_4$) occur freely at Gorge Creek, Ashburton; and jamesonite (sulphantimonide of lead, $Pb_2Sb_2S_5$) at Mt. deCourcy, North-West; whilst fine specimens of crystallised pyromorphite (chlorophosphate of lead, $PbCl_2 3Pb_3P_2O_8$) have been obtained from the Geraldine Mine, on the Murchison River.

Small quantities of galena are frequently found to characterise the richer portions of gold reefs, notably at Menzies, Coolgardie, and Norseman; whilst small lemon-yellow crystals of the rare mineral vanadinite (chlorovanadate of lead, $PbCl_2 3Pb_3V_2O_8$) are found closely associated with gold in the oxidised ores of Pinyalling, Mulline, and Coolgardie.

Lead ores have only been worked so far at Uarro, Geraldine, Northampton, Oakagee, Narra Tarra, and Jarrahdale. At most of these places, as well as in many other parts of the State, the lead mining industry is handicapped by the ore not containing sufficient silver to pay for its extraction, and under the circumstances it has for the present practically ceased.

The following tables show the production of lead ore of the State in so far as can be gauged by the export records of H. M. Customs.

Digitized by Google



W J. Petter Government Photolithographer, Perth. W A

Digitized by Google

St

ex
N
(c
Pl
ot
fre
of
m
3F
ch

th
N
va
as
Cc

N
th
mi
sil
fo

St
Cu

Digitized by Google

The Export of Lead Ore from Western Australia.

Year.	Ore Exported.	Value of Ore.
	tons.	£
1850	5·00	55·00
1851	*Nil.*	
1852	*Nil.*	
1853	*a*	4·00
1854	*Nil.*	
1855	25·00	250·00
1856		
1857	*Nil.*	
1858		
1859	13·50	135·00
1860	98·50	985·00
1861	79·00	790·00
1862	9·00	90·00
1863	230·00	2,300·00
1864	80·00	800·00
1865	703·00	8,436·00
1866	273·50	3,282·00
1867	902·00	10,824·00
1868	1,100·50	13,206·00
1869	699·50	8,394·00
1870	1,209·50	14,514·00
1871	420·00	5,040·00
1872	364·00	4,368·00
1873	965·50	11,586·00
1874	2,143·75	25,725·00
1875	2,289·00	27,468·00
1876	2,191·50	26,298·00
1877	3,955·50	47,466·00
1878	3,617·50	43,410·00
1879	2,775·00	33,300·00
1880	1,921·00	15,368·00
1881	1,400·50	11,204·00
1882	1,793·50	14,348·00
1883	1,038·00	7,266·00
1884	696·00	4,872·00
1885	465·00	3,255·00
1886	611·00	4,277·00
1887	471·00	4,710·00
1888	532·00	5,320·00
1889	250·00	2,500·00
1890	213·50	2,135·00
1891	25·00	250·00
1892	29·75	150·00
1893		
1894	*Nil.*	
1895		
1896		
1897	*a*	4·00
1898	5·00	33·00
1899	16·00	96·00
1900	26·85	242·00
1901	..	..
Total	**33,643·85**	**364,756·00**

a. No tonnage given. Declared at £4.

Digitized by Google

Export of Pig Lead from Western Australia.

Year.	Pig Lead Exported.	Value of Pig Lead.
	tons.	£
1853	55·00	1,200·00
1854	122·00	2,440·00
1855	133·75	2,675·00
1856	60·00	1,200·00
1857	120·50	2,410·00
1858	61·00	1,220·00
1859	24·75	495·00
1860 to 1866	no data	..
1867	*a* 3·00	50·00
1868 to 1874	no data	..
1875	4·25	89·25
1876	*a* 7·00	155·00
1877	*a* 1·00	15·00
1878 to 1879	no data	..
1880	*a* 5·00	89·00
1881	*a* 1·00	20·00
1882 to 1886	no data	..
1887	*a* 6·00	120·00
1888	*a* 2·00	40·00
1889 to 1896	no data	..
1897	*b* ·50	11·00
1898	no data	..
1899	77·00	1,077·00
1900	no data	..
1901	no data	..
Total	683·75	13,306·25

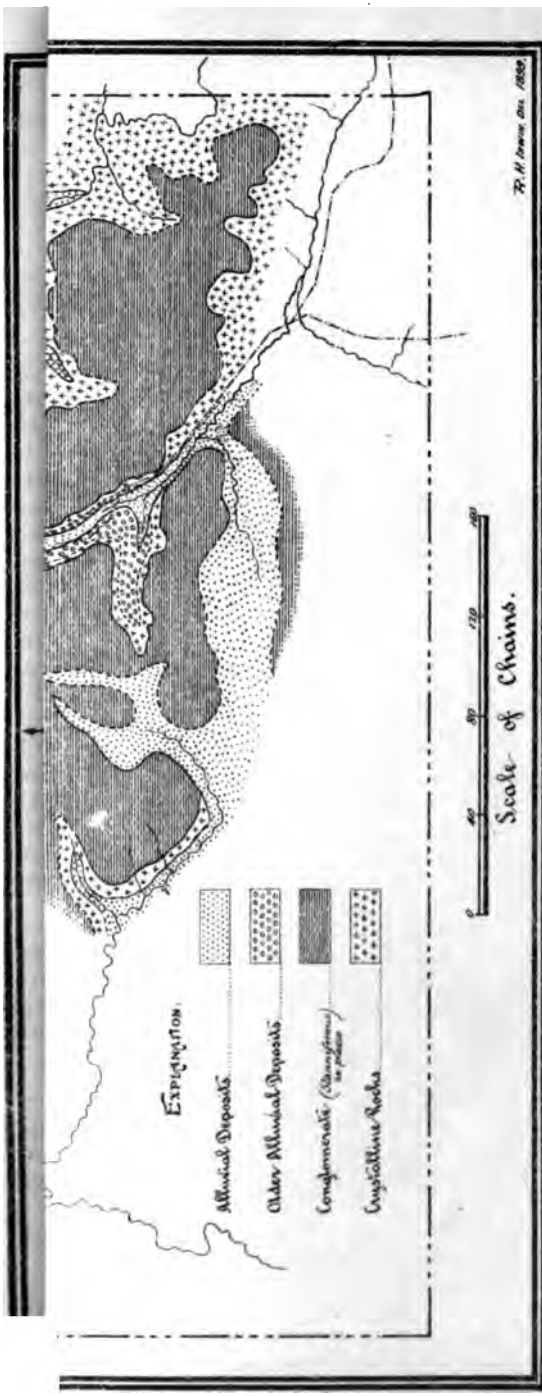
a. No tonnage given. Estimated. *b*. No tonnage given. Six packets estimated at 10cwt.

TIN.

Tin has been discovered in four widely-separated localities in the State, viz., at the heads of the Bow and the Lennard Rivers, in the Kimberley District; on the Thomas River, Gascoyne Goldfield; at Brockman's Soak and the Western Shaw, in the Pilbara District; and at Greenbushes, in the South-Western portion of the State. Mining operations have been most active at Greenbushes; a little has been done at Pilbara, but, so far as official information goes, very little prospecting seems to have been carried out.

Pure tin oxide contains 78 per cent. of the metal, but the native compound invariably contains more or less of the oxides of other metals, with the result that it seldom assays over 74 per cent. of the metal. The Pilbara cassiterite, which is dark brown in colour, would appear to average 70 per cent.; that from Greenbushes, which is quite black, slightly less.

Digitized by Google



H. J. Pether. Government Photolithographer, Perth, W.A.

:urally

ry very
us con-
e in the
ie-tenth
terial is
: of ore
average
kaolin,
garnet,
scheelite
) be the
mineral
terest to
from the
dentical.
ontamin-
ie purity
hese two
ind to be
up to 72

stones or
f igneous
minerals
clay, and

g granite
d highly-
(greisen)
istituents.
uantity in
. would be

he Green-
astern side
.L. 82/76.
ourmaline

Digitized by Google

1
1
1

The tin deposits of the State, wherever examined, fall naturally into two distinct categories :—

Superficial deposits :

(a.) Alluvial deposits.
(b.) Residuary sands, gravels, etc.

Deposits in Country Rock :

(c.) Tin-bearing granite and allied rocks.
(d.) Tin-bearing dykes.

Alluvial Deposits.—These are the most important and vary very largely in nature, ranging from an extremely hard ferruginous conglomerate of a stiff clay, or loose sand or gravel. The tin stone in the first-named is often extremely coarse, but more generally one-tenth of an inch or less in diameter, whilst that in the softer material is almost uniformly fine. Assays of ten samples of this class of ore varied from ·9 per cent. up to 33·3 per cent. of the metal, the average being 10·1 per cent. The associated minerals are quartz, kaolin, limonite, ilmenite, tourmaline, tantalite, stibiotantalite, garnet, zircon, gold, magnetite, rutile, and topaz. No wolfram or scheelite has been detected in the ore: the mineral, once thought to be the latter, having proved in every case to be stibiotantalite. This mineral (a tantalite of antimony) and tantalite are of the greatest interest to the miners and smelters, since it is impossible to separate them from the tin stone by dressing, their specific gravities being practically identical. They have therefore to be smelted with the tin ore, and by contaminating the smelted tin with antimony, etc., seriously affect the purity and value of it. Owing principally to the presence of these two minerals the dressed ore from the alluvial claims has been found to be very variable in richness, ranging from a trace only of tin up to 72 per cent.

Residuary Deposits.—These are either lateritic ironstones or sands, clays, etc., derived from the decomposition *in situ* of igneous rocks. They are frequently stanniferous. The chief minerals accompanying the tin are limonite, quartz, tourmaline, clay, and mica.

Tin-bearing Granite and allied Rocks.—The tin-bearing granite consists of a granite passing in places into a foliated and highly-micaceous granite, with little or no felspar. This granite (greisen) contains tin, tourmaline, zircon, garnet, etc., as accessory constituents. In some parts of the field the tourmaline occurs in such quantity in the gneiss as to give a distinctive character to the rock, and would be better described as a tourmaline gneiss.

Tin-bearing Dykes.—These occur in several parts of the Greenbushes Tinfield. Ore of the most typical occurs on the Eastern side of the main Bridgetown Road, upon what was originally M.L. 82/76. A shaft has been put down to a shallow depth upon a tourmaline-

Digitized by Google

bearing dyke, which was met with beneath the conglomerate at a depth of about five feet below the surface. The conglomerate contains detrital tourmaline, which led to the discovery of the dyke. As exposed in the workings, the width of the dyke is about two feet six inches, having a general North-Westerly strike, with an underlie to the South-West at an angle of 70°. The tourmaline is enclosed in a ferruginous clayey matrix, which contains occasional patches of quartzose material; the dyke may be a tourmaline-bearing pegmatite. The rock contains a small quantity of very angular tin, associated with large quantities of titanium. The tourmaline itself carries in parts appreciable quantities of tin. An assay of a carefully selected sample, believed to be characteristic of the whole dyke, yielded in the official laboratory 1·97 parts per hundred of metallic tin. There are several other parallel dykes throughout the field, but, so far, they have not been very much exploited, and do not appear to be very rich.

The output of tin ore for 1900, as compared with that of the previous year, shows an increase of 488 tons, valued at £31,432.

The Marble Bar Tinfield shows a largely increased output for the year, the black tin produced amounting to 388 tons, as against 57 tons in 1899.

The output of black tin from the State for the year 1901 was 734 tons, valued at £40,000, which shows a decrease, when compared with the year 1900, of 89 tons; the decrease in the out put from the Greenbushes Tinfield being 114 tons, while the Pilbara field shows a slight increase of 25 tons.

The following table shows the production of tin as reported to the Mines Department, the export of tin as shown by the Customs records, and the export of tin ingots from the State :—

Production of Tin Ore from Greenbushes and Pilbara, as reported to the Mines Department.

Year.	Greenbushes.		Pilbara.		Total.	
	Ore Raised.	Value of Ore.	Ore Raised.	Value of Ore.	Ore Raised.	Value thereof.
	tons.	£	tons.	£	tons.	£
Previous to 1899	1,590·33	66,108	75·45	4,419	1,665·78	70,527
1899	277·32	21,658	57·50	3,612	334·82	25,270
1900	435·62	29,528	387·87	27,174	823·49	56,702
1901	321·34	18,852	412·98	21,148	734·32	40,000
Total ..	2,624·61	136,146	933·80	56,353	3,558·41	192,499

Digitized by Google

The Export of Tin Ore from Western Australia.

Year.	Tin Ore Exported.	Estimated Value.	Remarks.
	tons.	£	
1889 ..	*a* 5·00	300·00	*a*. The Collector of Customs reports:— "In all probability, the produce of the Greenbushes Tin-field"
1890 ..	*a* 67·50	5,400·00	
1891 ..	204·00	10,200·00	
1892 ..	265·49	13,843·00	
1893 ..	227·95	11,134·00	
1894 ..	390·25	15,274·00	
1895 ..	277·15	9,703·00	
1896 ..	137·25	4,338·00	
1897 ..	95·55	3,275·00	
1898 ..	68·14	2,760·00	
1899 ..	307·96	23,163·00	
1900 ..	470·28	38,178·00	
1901 ..	506·50	39,495·00	
Total ..	3,023·02	177,063·00	

The Export of Tin Ingots from Western Australia.

Year.	Tin Ingots Exported.	Value thereof.	Remarks.
	tons.	£	
1900 ..	142·35	18,872·00	
1901 ..	96·50	12,607·00	
Total ..	238·85	31,479·00	

IRON.

The ores of iron are extremely widely distributed throughout Western Australia; but, with one or two exceptions, the area in which the exploitation of such deposits is actively prosecuted is very limited, such areas being at present confined to localities where ore used as a flux can be obtained in considerable quantities. Some of the richest and most extensive deposits are absolutely valueless, owing to their geographical position. The iron deposits of the State so far examined can be broadly separated into two main divisions:—

(*a*.) The ores associated with the crystalline schists and other allied rocks.

The mportant ores of this class are developed most extensively in the watershed of the Murchison River, more especially between 25 deg. and 28 deg. of South latitude, and 116 deg. and 119 deg. East longitude.

The most important localities are Horseshoe, Peak Hill, Mount Gould, and Mount No Name, Peak Hill; and Mount Hale, Weld Range (Wilgie Myah), Munara Hills, and Mount Narryer, Murchison. Less important deposits of this nature occur at Marble Bar, Pilbara; Kilalo Well, Murchison; Wiluna, Mount Townsend, and Mount Marion, East Murchison; Bardoc, Broad Arrow; Edjudina, North

Digitized by Google

Coolgardie; Mount Jackson, Yilgarn; and Gennapullin, Blackboy Hill, and Green Hills, Avon District. These deposits consist of highly inclined beds, bands, and lenses of almost pure haematite (occasionally magnetite), or admixtures in all proportions of haematite and quartz, interbedded with and sometimes replacing quartzites and quartz schists.

(*b.*) The superficial deposits of limonite (laterite ore) which occupy extensive areas in many and widely-separated portions of the State, and the soft porous deposits of hydrated oxide of iron (bog ore) of comparatively recent origin.

The laterite ores, together with the gravel resulting from their denudation, are the most widely-distributed ores in the State. They vary very much in their composition. The ores are most largely developed on the tops of hills or ranges; in depth they pass gradually, without any distinct line of demarcation, into the rock upon which they lie. These deposits owe their origin to the concentration of the ferric oxide by the action of atmospheric change. Nowhere do any of these ores attain any great thickness. The ores of this class have been principally used for fluxing purposes, to which end 45,772 tons of ore were raised up to the end of 1901.

The bog iron ores consist of soft porous deposits of hydrated oxide of iron; these occur at different points along the Southern and Western coast line. Up to the present, however, deposits of this class have not been exploited.

The following table shows the production of iron ore in Western Australia up to 1901 :—

The Production of Iron Ore in Western Australia

Year.	Ore Raised.	Estimated Value.		
	tons.	£	s.	d.
Previous to 1899 ..	100	300	0	0
1899	12,852	8,939	0	0
1900	12,251	9,258	0	0
1901	20,569	13,246	0	0
Total	45,772	31,743	0	0

This ore is used principally as a flux.

SILVER.

There are no silver mines being worked in the State, though in the lead deposits of the North-West there is a source of silver which, up to the present, has hardly been touched.

The average Kalgoorlie ore is said to contain about one ounce of silver for every two ounces of gold, but very little of the former seems to be recovered in the treatment to which the ore is subjected.

Digitized by Google

The crude gold produced by the State during 1900 had an average fineness of 88·05, and contained, therefore, about 176,000ozs. of fine silver. Apart from this no silver was produced in the State, except a few ounces obtained in smelting copper ores from Geraldine and Ravensthorpe, and telluride ores from Kalgoorlie.

The following tables show the production of silver as reported to the Mines Department, and the export thereof as shown by the Customs records :—

The Export of Silver from Western Australia.

Year.	Silver Exported.	Value thereof.	Remarks.
	ozs.	£	
1900 ..	28,749·00	3,594·00	
1901 ..	60,869·00	7,609·00	
Total ..	89,618·00	11,203·00	

The Production of Silver in Western Australia.

Year.	Quantity.	Value.	
	ozs.	£	
1901	356·26	43	

MICA.

Mica is probably one of the minerals most widely-diffused throughout the State; but it is only of any real commercial value when it occurs in large sheets, or can be obtained in considerable quantities. The mica-producing strata are the crystalline schists and allied rocks, which occupy fully two-thirds of the (geologically) known areas of Western Australia. Generally it is found that the mica-producing rocks are pegmatitic granites, which traverse the crystalline schists, etc., either in the form of dykes, sheets, or lenticular masses, which are often parallel to the foliation of the surrounding strata.

Under the generic term "Mica" several distinct mineral species are included; they are all characterised by the readiness with which they split into very thin, elastic plates. Four of the species are of commercial importance, viz., Muscovite (common or white mica); Phlogopite (amber mica); Biotite (black mica); and Lepidolite (lithia mica). They all occur under somewhat similar geological conditions.

What may be called possible commercial mica is known to occur at the following different places in the State :—Nokenena Brook, Northampton; Tambourah, Pilbara Goldfield; Mullalyup, Darling Ranges; Bindoon; The Mica Mine, Londonderry, Coolgardie Goldfield.

Digitized by Google

Up to the present it does not appear that much mica of marketable value has yet been raised in the State. The following table gives the export of mica, as shown by the records in the Customs House :—

The Export of Mica from Western Australia.

Year.	Mica Exported.	Estimated Value.	Remarks.
		£ s. d.	
1892 ..	*	25 0 0	*Not stated.
1893 ..	*	4 0 0	
1894 ..	*Nil*	*Nil*	
1895 ..	*	3 0 0	
1896 ..	*Nil*	*Nil*	
1897 ..	*	209 0 0	
1898 ..	*Nil*	*Nil*	
1899 ..	†	50 0 0	† 13 packages ; weight not stated.
1900 ..	†	3 0 0	
1901 ..	..	..	
	..	294 0 0	

ASBESTOS.

Asbestos has been found in widely-separated localities in the State ; but, so far, with the possible exception of that from Tambourah, on the West Pilbara Goldfield, most of the mineral discovered up to the present time has proved to be actinolite, of so coarsely fibrous a nature as to be practically valueless.

The asbestos from Tambourah turns out to be fibrous chrysotile, identical with the Canadian mineral, which is so much valued. The Tambourah asbestos, unlike most of the Australian mineral, has not the great defect of a low tensile strength, and in all the points—infusibility, softness, flexibility, fineness, and the ease with which the fibres can be separated—is well above the average. No scientific examination of the district having been undertaken, information as to the mode of occurrence of the mineral is unfortunately not available.

The following table shows the production of asbestos in the State, in so far as may be gauged by the records of H.M. Customs House :—

The Export of Asbestos from Western Australia.

Year.	Asbestos Exported.	Estimated Value.	Remarks.
	tons.	£	
1899 ..	*	1·00	*One package ; weight not stated.
1900 ..	*Nil*	*Nil*	
1901 ..	*Nil*	*Nil*	
Total ..	..	1·00	

Digitized by Google

Government Photolithographer Perth, W.A.

extent
ut 50
of the
roved,
ns are
bitu-
ent.

ctory.
of the
tically
ut for
ortage

oal in

t of
been

Digitized by Google

Up
ble val
he exp

As
but, so
on the
the pre
nature

Th
identica
Tambo
the gre
bility, a
can be
of the c
occurre

Th
in so fa

Digitized by Google

COAL.

The only coalfield at present opened up in the State to any extent is that of the Collie River. This field embraces an area of about 50 square miles, and is connected with the main railway system of the State. A considerable number of workable seams have been proved, by mining and boring, to exist in the basin. All these seams are practically identical in character, being hydrous, non-caking, bituminous coals, varying noticeably in the proportion of ash present.

During 1900 the progress of the coalfield was satisfactory. The output of coal, 118,410 tons, was more than double that of the previous year. In the year 1901 the output from Collie was practically identical with that of the previous year, being 117,836 tons. But for a strike which took place in the early part of the year, and the shortage of trucks, the output would probably have been greater.

The following tables show the production and export of coal in Western Australia up to 1901 :—

The Production of Coal in Western Australia.

Year.	Coal Raised.	Value thereof.	Remarks.
	tons.	£	
Previous to 1899	3,508·00	1,761·00	
1899	54,336·00	25,951·00	
1900	118,410·00	54,835·00	
1901	117,835·80	68,561·00	
Total ..	**294,089·80**	**151,108·00**	

The Export of Coal from Western Australia.

Year.	Coal Exported.	Value thereof.	Remarks.
	tons.	£	
1898	1·00	1·00	
1899	798·00	772·00	
1900	355·00	350·00	
1901	970·75	969·00	
Total ..	**2,124·75**	**2,092·00**	

DIAMONDS.

The following table shows the production and export of diamonds from the State. These were supposed to have been obtained from the Pilbara District :—

Export of Diamonds from Western Australia.

Year.	Quantity.	Value.
	carats.	£
1901	*a*	1,000·00

a. Declared; weight not stated.

Digitized by Google

Production of Diamonds in Western Australia.

Year.	Quantity.	Value.
	carats.	£
1899	*a*	24·00
1900	..	..
1901	..	..
Total ..	..	**24·00**

a. Weight unknown.

LIMESTONE.

Limestone is used as a flux in the State, and also in cyaniding purposes. The following figures show the production of limestone in the State, so far as the actual figures are available. They are believed, however, to form only a small portion of the actual production.

The Production of Limestone in Western Australia.

Year.	Limestone Raised.	Value thereof.	Remarks
	tons.	£	
1899 ..	17,593·00	2,838·00	
1900 ..	15,926·85	3,594·00	
1901 ..	18,210·00	4,348·00	
	51,729·85	**10,780·00**	

GUANO.

While, perhaps, the accumulations of guano occurring in the Abrolhos Islands and elsewhere in the North, formed as they are by organic agencies, may not in a strictly scientific sense be mineral deposits, their economic importance is a sufficient justification for referring to them in a description of the mineral resources of the State.

That the importance of these deposits is considerable, may be judged from the appended table of statistics, showing the production of guano in the State, as prepared from official data. No record would appear to have been kept of the quantity of guano raised previous to the year 1847; also, during the years 1847 to 1855, 1855 to 1865, 1865 to 1872, 1872 to 1876, and also the years from 1879 to 1882. From the official figures it appears that since 1847 87,865 tons of guano were raised, and that the total royalty paid to the Government from that date amounted to £41,385. From the year 1847, as shown by the Customs figures, 82,813 tons of guano, valued at

Digitized by Google

of the
s, lat.
colhos

tched
icially
This
them,
posits
of the
. Of
o con-
lands
es in
uano.
made
and
tons
Small

'alue.

s.	d.
0	0
0	0
0	0
0	0
10	0
0	0
0	0
0	0
0	0
0	0
10	0
0	0
15	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
0	0
7 15	0

Digitized by Google

Digitized by Google

£328,758, were exported from the State. The chief source of the guano raised was, in and about 1878, in the Lacepede Islands, lat. 17° S., long. 122 E.; and at present in the Houtman Abrolhos Islands, West of the town of Geraldton.

In August 1897, Mr. Licensed Surveyor Wells was despatched from Geraldton to the Abrolhos Islands for the purpose of officially estimating the quantity of guano still available on the group. This officer visited 10 islands of the Eastern group, and on four of them, viz., Rat, Third Beacon, and Wooded Islands, found guano deposits varying from four inches to 27 inches in thickness. The islands of the Eastern group are estimated to contain 13,944 tons of guano. Of the 14 islands of the Pelsart group examined, nine were found to contain guano deposits, viz., Pelsart, Gun Island, and seven small islands adjacent. The deposits varied from seven inches to 13 inches in thickness. The group is supposed to contain 48,468 tons of guano. Mr. Wells examined 18 islands of the Wallaby group, but only made surveys of four, viz., West Wallaby, Pelican Island, and North and South Pigeon Islands. These were estimated to contain 38,088 tons of guano, varying in thickness from four inches to 17 inches. Small quantities of guano also occur in several of the lesser islands.

The Production of Guano in Western Australia.

Year.	Guano Raised.			Guano Exported.	
	Quantity.	Total Value.	Total Royalty Paid.	Quantity.	Total Value.
	tons cwt.	£ s. d.	£ s. d.	tons cwt.	£ s. d.
1847	*	*	*	3 0	18 0 0
1855	*	*	*	25 0	125 0 0
1865	*	*	*	35 0	175 0 0
1872	*	*	*	52 0	107 0 0
1876	2,534 0	..	1,267 0 0	735 0	367 10 0
1877	14,[illegible]35 0	..	7,177 10 0	1,212 0	6,060 0 0
1878	19,865 3	..	9,932 11 6	13,219 0	66,095 0 0
1879	*	*	*	12,041 0	54,184 0 0
1880	*	*	*	1,330 0	6,650 0 0
1881	*	*	*	*Nil*	..
1882	*	*	*	*Nil*	..
1883	724 0	..	362 0 0	456 0	2,964 0 0
1884	2,505 0	..	2,012 5 11	1,163 0	7,559 10 0
1885	973 0	..	311 11 4	528 0	3,432 0 0
1886	2,631 0	..	1,654 3 0	10,157 10	66,023 15 0
1887	3,360 0	..	2,052 14 0	3,158 0	20,527 0 0
1888	3,582 0	..	1,433 12 0	3,110 0	12,440 0 0
1889	3,583 0	..	1,697 10 0	3,395 0	8,488 0 0
1890	4,038 0	..	1,956 10 0	3,913 0	9,783 0 0
1891	6,225 0	..	2,858 10 0	6,251 0	15,628 0 0
1892	2,569 0	..	1,355 13 4	2,508 0	4,384 0 0
1893	3,297 0	..	1,570 0 0	4,030 0	7,052 0 0
1894	2,001 0	..	969 10 0	2,239 0	3,919 0 0
1895	1,945 0	..	544 0 0	100 0	200 0 0
1896	1,618 0	..	191 5 0	1,660 0	4,506 0 0
1897	2,569 0	..	331 6 0	1,496 5	3,250 0 0
1898	3,604 0	..	1,278 14 11	3,950 0	9,386 0 0
1899	3,092 4	..	743 5 0	2,045 10	5,165 0 0
1900	1,103 0	..	1,094 8 0	2,902 0	7,527 0 0
1901	1,692 0	..	590 16 0	1,099 0	2,742 0 0
Totals ..	87,865 7	..	41384 16 0	82,813 5	328,757 15

* No records.

Digitized by Google

The following Tables, containing particulars collected by the
the proportions which the Mining Industry of Western Australia has

Areas of the Goldfields, Number and Area of Gold Mining Leases during each of the

Goldfields, etc.		Leases in Force on 31st December.				Average Number of Men Employed at Mines. (b)	
Groups and Fields, etc.	Area of Goldfields.	Number.		Area.			
		1900.	1901.	1900.	1901.	1900.	1901.
	Square Miles.	No.	No.	acres.	acres.	No.	No.
Northern Goldfields—							
Kimberley	46,886	4	3	38	19	7	6
Pilbara	34,880	59	52	529	509	111	206
West Pilbara ..	9,480	13	3	161	36	52	5
Ashburton	14,252	..	..	..	..	..	..
Gascoyne	5,061	5	1	72	12	..	..
Central Goldfields—							
Peak Hill	12,194	120	98	1,744	1,334	354	346
East Murchison ..	28,242	147	151	2,064	2,133	873	856
Murchison	20,513	338	354	3,529	3,630	1,441	1,548
Yalgoo	18,921	39	41	480	512	226	173
Eastern Goldfields—							
Mt. Margaret ..	42,154	277	383	5,500	6,909	1,851	2,126
North Coolgardie ..	30,609	353	381	4,643	5,085	1,510	1,753
Broad Arrow ..	590	113	97	1,445	1,251	646	409
North-East Coolgardie	21,542	179	176	2,267	2,207	860	752
East Coolgardie ..	632	382	295	6,368	4,665	5,903	6,313
Coolgardie	11,974	335	293	4,356	3,659	1,752	1,330
Yilgarn	15,593	48	32	765	497	497	294
Dundas	17,848	93	85	1,164	986	526	496
Other Goldfields—							
Donnybrook ..	102	a51	31	a785	447	80	82
Phillips River ..	1,300	5	27	114	607	58	60
Other Localities—							
Fremantle (Smelting Works)	..	..	..	..	..	..	..
Northam (Milling) ..	..	..	..	..	..	..	..
Total ..	332,773	a2,561	c2,503	a36,024	c34,498	16,747	16,755

a. Including 15 leases, covering 210 acres, taken up under "The Mining on Private Property
c. Including 21 leases, covering 306 acres, taken up under "The Mining on Private

Digitized by Google

STATISTICS.

Mines and Customs Departments, afford an opportunity of estimating of late assumed :—

under the Goldfields Act, and Employment of Labour and Machinery, Years 1900 and 1901.

Machinery and Plant on Mining Leases, etc.						Estimated Value of Plant (1900).		Estimated Value of Plant (1901).	
Batteries (including Government Batteries). Heads of Stamps.		Other Crushing Mills.		Cyanide Leaching Vats.		Government Public Batteries.	Total Government and Private Machinery.	Government Public Batteries.	Total Government and Private Machinery.
1900.	1901.	1900.	1901.	1900.	1901.				
No.	No.	No.	No.	No.	No.	£	£	£	£
70	25	2	..	..	..	..	8,305	..	5,500
115	115	2	6	4	5	..	36,547	..	34,315
30	..	1	2	..	..	..	12,875	..	500
..	..	..	..	..	..	..	..	..	..
..	..	1	..	..	..	..	1,525	..	..
40	50	..	1	..	4	6,434	32,291	6,457	105,703
155	170	5	6	12	24	..	106,348	2,185	158,011
513	538	6	5	72	106	14,896	244,999	24,705	332,154
60	70	5	2	..	9	..	34,727	..	30,702
389	484	5	6	83	116	6,181	324,608	6,178	413,784
358	353	6	4	75	96	23,241	249,640	32,615	284,502
235	240	4	5	30	41	..	159,880	..	134,359
215	235	22	23	11	82	..	124,170	..	116,543
360	470	87	84	184	187	..	1,077,557	..	1,814,422
554	534	6	11	58	89	5,230	327,522	2,413	284,799
175	175	5	6	52	69	..	80,632	..	81,343
150	135	8	7	35	43	6,431	86,819	8,727	87,584
5	..	2	1	..	..	1,550	3,200	..	1,200
..	20	..	..	..	..	..	..	..	10,809
..	..	3	3	..	..	..	52,710	..	56,060
60	60	..	..	5	5	..	30,052	..	30,052
3,484	3,674	170	172	621	876	63,963	2,994,407	83,280	3,982,342

Act, 1898" (62 Vict., No. 29).
Property Act, 1898" (62 Vict., No. 29).

b. Not including prospectors and alluvial miners.

Digitized by Google

Production of Crude Gold from Ore (not including that obtained from Specimens and by dollying) for each of the Goldfields, as reported to the Mines Department.

Goldfield.	Total for Year 1901.		Total previous to 1901.		Total Gold Production.		
	Ore Treated.	Gold therefrom.	Ore Treated.	Gold therefrom.	Ore Treated.	Gold therefrom.	Average per ton treated.
	tons.	ozs.	tons.	ozs.	tons.	ozs.	ozs.
Kimberley Goldfield	185·00	133·06	15,038·50	13,833·77	15,223·50	13,966·83	·91
Pilbara "	5,414·11	8,938·25	36,720·81	76,375·97	42,134·92	85,314·22	2·02
West Pilbara Goldfield	48·00	94·50	2,532·15	3,320·59	2,580·15	3,415·09	1·32
Gascoyne "	..	..	236·70	221·09	236·70	221·09	·93
Peak Hill "	24,025·50	20,255·47	35,089·79	89,625·09	59,115·29	109,880·56	1·86
East Murchison "	84,618·45	75,585·06	144,267·74	163,435·30	228,886·19	239,020·36	1·04
Murchison "	113,213·43	144,323·00	438,552·50	455,513·32	551,765·93	599,836·32	1·08
Yalgoo "	13,117·30	9,221·27	44,109·18	35,914·04	57,226·48	45,135·31	·79
Mt. Margaret "	246,578·00	188,212·87	259,344·01	296,721·19	505,922·01	484,934·06	·97
North Coolgardie "	108,271·65	147,053·59	273,089·28	377,080·96	381,360·93	524,134·55	1·30
Broad Arrow "	44,740·13	33,284·62	186,646·13	147,865·87	231,386·26	181,150·49	·78
North-East Coolgardie Goldfield	51,978·25	49,557·06	267,753·73	264,422·80	319,731·98	313,979·86	·90
East Coolgardie Goldfield ..	693,799·73	988,789·75	1,387,395·91	2,450,731·76	2,081,195·64	3,439,521·51	1·65
Coolgardie "	121,675·91	81,754·62	483,316·89	460,732·70	604,992·80	542,487·32	·80
Yilgarn "	26,529·00	26,564·23	326,526·63	167,825·84	353,055·63	194,390·07	·55
Dundas "	38,373·00	36,280·22	159,225·13	144,785·19	197,598·13	181,065·41	·91
Donnybrook "	48·50	3·86	672·80	947·14	721·30	951·00	1·31
From Goldfields generally ..	..	..	..	1,233·90	..	1,233·90	..
Ashburton Goldfield	..	..	..	..	..	..	..
Phillips River "	192·00	225·73	..	..	192·00	225·73	1·17
Total	1,572,807·96	1,810,277·16	4,060,517·88	5,150,586·52	5,633,325·84	6,960,863·68	1·20

Digitized by Google

*Quantity of Ore treated and Gold obtained, Number and Area of Gold Mining Leases in force under the Goldfields Act, and Employment of Labour and Machinery on the Western Australian Goldfields for each of the years, 1895 to 1902.**

Years.	Recorded Gold Yield during the Year.			Leases in force at end of year.		Men employed at Mines.	Mining Machinery erected to end of year.		
	Ore Treated.	Crude Gold from Ore.	Alluvial and Dolled Gold.	No.	Area.		Heads of Stampers.	Other Mills.	Cyanide Leaching Vats.
	tons.	ozs.	ozs.		acres.	No.	No.	No.	No.
1895	80,575	77,236	154,277	6,331	89,706	21,416	841	19	4
1896	166,780	252,222	29,043	8,021	119,294	20,236	1,479	35	10
1897	415,424	624,201	19,413	4,001	59,108	17,903	2,140	28	19
1898	762,083	960,249	81,463	2,835	39,394	† 13,066	3,001	60	298
1899	1,173,437	1,539,212	61,551	‡ 2,609	‡ 36,118	† 16,060	3,338	83	368
1900	1,289,347	1,472,990	40,926	§ 2,546	§ 35,814	† 16,747	3,484	170	621
1901	1,572,808	1,810,277	31,221	¶ 2,503	¶ 33,492	† 16,755	3,674	172	876
1902	1,888,950	2,087,044	30,197	2,424	32,570	† 17,825	3,854	158	1,036

* Detailed Statistics have only been collected since 1895. previous years are more or less incomplete estimates.

† Not including prospectors or alluvial miners. The figures for

‡ Exclusive of 16 leases, covering 218 acres, held under "The Mining on Private Property Act, 1898."

§ Exclusive of 15 leases covering 210 acres, taken up under "The Mining on Private Property Act, 1898."

¶ Exclusive of 21 leases, covering 306 acres, taken up under "The Mining on Private Property Act, 1898" (62 Vict., No. 29).

Digitized by Google

Production of Crude Gold from Ore (not including that obtained from Specimens and by dollying) for each of the Goldfields, as reported to the Mines Department.

Goldfield.	Total for Year 1901.		Total previous to 1901.		Total Gold Production.		
	Ore Treated.	Gold therefrom.	Ore Treated.	Gold therefrom.	Ore Treated.	Gold therefrom.	Average per ton treated.
	tons.	ozs.	tons.	ozs.	tons.	ozs.	ozs.
Kimberley Goldfield	185·00	133·06	15,038·50	13,833·77	15,223·50	13,966·83	·91
Pilbara "	5,414·11	8,938·25	36,720·81	76,375·97	42,134·92	85,314·22	2·02
West Pilbara Goldfield	48·00	94·50	2,532·15	3,320·59	2,580·15	3,415·09	1·32
Gascoyne "	..	..	236·70	221·09	236·70	221·09	·93
Peak Hill "	24,025·50	20,255·47	35,089·79	89,625·09	59,115·29	109,880·56	1·86
East Murchison "	84,618·45	75,585·06	144,267·74	163,435·30	228,886·19	239,020·36	1·04
Murchison "	113,213·43	144,323·00	438,552·50	455,513·32	551,765·93	599,836·32	1·08
Yalgoo "	13,117·30	9,221·27	44,109·18	35,914·04	57,226·48	45,135·31	·79
Mt. Margaret "	246,578·00	188,212·87	259,344·01	296,721·19	505,922·01	484,934·06	·97
North Coolgardie "	108,271·65	147,053·59	273,089·28	377,080·96	381,360·93	524,134·55	1·30
Broad Arrow "	44,740·13	33,284·62	186,646·13	147,865·87	231,386·26	181,150·49	·78
North-East Coolgardie Goldfield	51,978·25	49,557·06	267,753·73	264,422·80	319,731·98	313,979·86	·90
East Coolgardie Goldfield ..	693,799·73	988,789·75	1,387,395·91	2,450,731·76	2,081,195·64	3,439,521·51	1·65
Coolgardie "	121,675·91	81,754·62	483,316·89	460,732·70	604,992·80	542,487·32	·80
Yilgarn "	26,529·00	26,564·23	326,526·63	167,825·84	353,055·63	194,390·07	·55
Dundas "	38,373·00	36,280·22	159,225·13	144,785·19	197,598·13	181,065·41	·91
Donnybrook "	48·50	3·86	672·80	947·14	721·30	951·00	1·31
From Goldfields generally ..	..	..	..	1,233·90	..	1,233·90	..
Ashburton Goldfield	..	..	..	..	..	..	..
Phillips River "	192·00	225·73	..	..	192·00	225·73	1·17
Total	1,572,807·96	1,810,277·16	4,060,517·88	5,150,586·52	5,633,325·84	6,960,863·68	1·20

Digitized by Google

*Quantity of Ore treated and Gold obtained, Number and Area of Gold Mining Leases in force under the Goldfields Act, and Employment of Labour and Machinery on the Western Australian Goldfields for each of the years, 1895 to 1902.**

Years.	Recorded Gold Yield during the Year.			Leases in force at end of year.		Men employed at Mines.	Mining Machinery erected to end of year.		
	Ore Treated.	Crude Gold from Ore.	Alluvial and Dolled Gold.	No.	Area.		Heads of Stampers.	Other Mills.	Cyanide Leaching Vats.
	tons.	ozs.	ozs.		acres.	No.	No.	No.	No.
1895	80,575	77,236	154,277	6,331	89,706	21,416	841	19	4
1896	166,780	252,222	29,043	8,021	119,294	20,236	1,479	35	10
1897	415,424	624,201	19,413	4.001	59,108	17,903	2,140	28	19
1898	762,083	960,249	81,463	2,835	39,394	† 13,066	3,001	60	298
1899	1,173,437	1,539,212	61,551	‡2,609	‡ 36,118	† 16,060	3,338	83	368
1900	1,289,347	1,472,990	40,926	§ 2,546	§ 35,814	† 16,747	3,484	170	621
1901	1,572,808	1,810,277	31,221	¶ 2,503	¶ 33,492	† 16,755	3,674	172	876
1902	1,888,950	2,087,044	30,197	2,424	32,570	† 17,825	3,854	158	1,036

* Detailed Statistics have only been collected since 1895. † Not including prospectors or alluvial miners. The figures for previous years are more or less incomplete estimates. ‡ Exclusive of 16 leases, covering 218 acres, held under "The Mining on Private Property Act, 1898." § Exclusive of 15 leases covering 210 acres, taken up under "The Mining on Private Property Act, 1898." ¶ Exclusive of 21 leases, covering 306 acres, taken up under "The Mining on Private Property Act, 1898" (62 Vict., No. 29).

Digitized by Google

Annual Gold Production of Western Australia since 1886, showing Raw Gold entered for Export, plus Raw Gold received at the Perth Branch of the Royal Mint (from May, 1899), the figures also being reduced to fine Gold.

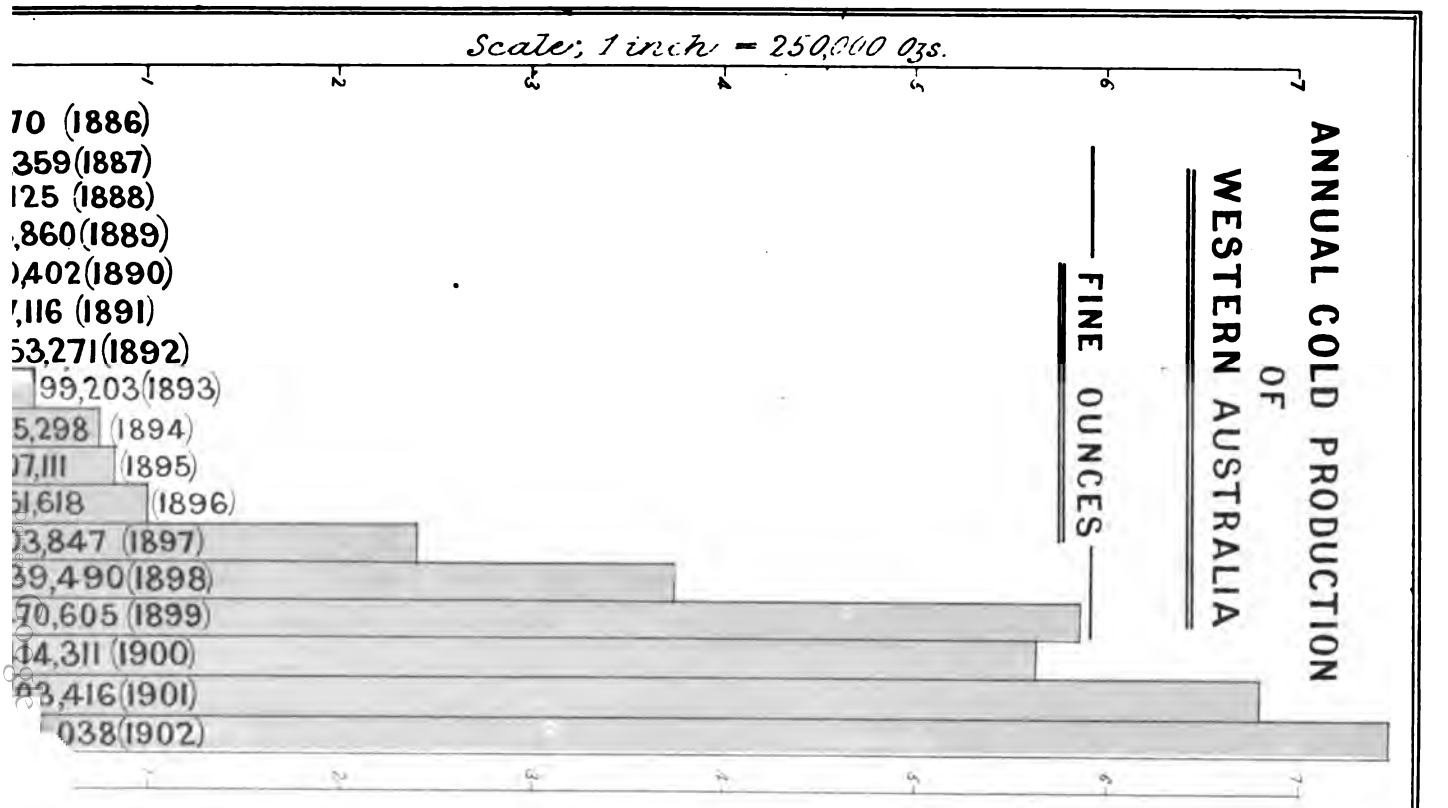
Period.	Quantity of Raw Gold.				Value.
	Exported.	Received at Perth Mint.	Total.		
	(crude) ounces.	(crude) ounces.	(crude) ounces.	(fine) ounces.	£
Year 1886	302	..	302	270	1,148
Do. 1887	4,873	..	4,873	4,359	18,517
Do. 1888	3,493	..	3,493	3,125	13,273
Do. 1889	15,493	..	15,493	13,860	58,874
Do. 1890	22,806	..	22,806	20,402	86,663
Do. 1891	30,311	..	30,311	27,116	115,182
Do. 1892	59,548	..	59,548	53,271	226,282
Do. 1893	110,891	..	110,891	99,208	421,386
Do. 1894	207,131	..	207,131	185,298	787,098
Do. 1895	231,513	..	231,513	207,111	879,749
Do. 1896	281,265	..	281,265	251,618	1,068,807
Do. 1897	674,994	..	674,994	603,847	2,564,977
Do. 1898	1,050,184	..	1,050,184	939,490	3,990,699
Do. 1899	1,434,570	209,307	1,643,877	1,470,605	6,246,753
Do. 1900	999,767	581,183	1,580,950	1,414,311	6,007,610
Do. 1901	1,019,109	860,281	1,879,390	1,703,416	7,235,652
Do. 1902	822,827	1,354,615	2,177,442	1,871,038	7,947,663
From 1886 to 31st December, 1902 ..	6,969,077	3,005,386	9,974,463	8,868,340	37,670,313

*One oz. of fine gold = £4 4s. 11 5-11d.

Quantity of Crude Gold Exported from Western Australia to each State during each of the Years, 1897 to 1902.

State.	1897.	1898.	1899.	1900.	1901.	1902.
	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
United Kingdom ..	191,591	439,877	710,258	736,580	931,386	685,544
Victoria	423,299	545,415	514,199	191,632	60,466	52,605
New South Wales	611	9,047	161,333	31,435	20,651	65,436
South Australia ..	59,461	55,793	48,452	29,995	6,580	4,579
Queensland ..	..	33	167	355	..	3
Tasmania	..	..	..	..	..	1
New Zealand ..	10	..	..	..	..	..
France	17	3	..	9,770	..	..
Germany	5	..	162	..	..	3,553
Italy	..	16	..	..	..	..
Denmark	..	..	..	..	26	..
Belgium	..	..	..	..	..	11,102
India	..	..	..	..	4,734	74,608
Singapore	..	..	..	..	..	3
Totals	674,994	1,050,184	1,434,571	999,767	1,023,843	897,434

Digitized by Google


ANNUAL GOLD PRODUCTION
OF
WESTERN AUSTRALIA
FINE OUNCES
Scale; 1 inch = 250,000 ozs.
1
2
3
4
5
6
7
70 (1886)
359(1887)
125 (1888)
,860(1889)
),402(1890)
',116 (1891)
53,271(1892)
99,203(1893)
5,298 (1894)
17,111 (1895)
51,618 (1896)
53,847 (1897)
39,490(1898)
70,605 (1899)
14,311 (1900)
83,416(1901)
038(1902)

Digitized by Google

Quantity of Gold, the Product of Western Australia, entered for Export and received at the Perth Branch of the Royal Mint, from each Goldfield up to the 31st of December, 1902.

Year.	Kimberley.	Pilbara.	West Pilbara. a	Ashburton.	Gascoyne. b	Peak Hill. c	East Murchison. c	Murchison.	Yalgoo. d	Mount Margaret. e	North Coolgardie.	Broad Arrow. e
	(crude) ounces.	(crude) ounces.	(crude) ounces.	(crude) ounces.	(crude) ounces.	(crude) ounces.	(crude) ounces.	(crude) ounces.	(crude) ounces.	(crude) ounces.	(crude) ounces.	(crude) ounces.
1886	302	..	..	..	..	..	..	..	..	..	..	..
1887	4,873	..	..	..	..	..	..	..	..	..	..	..
1888	3,493	..	..	..	..	..	..	..	..	..	..	..
1889	2,464	11,170	..	..	..	..	..	..	..	..	..	..
1890	4,474	16,055	..	..	..	..	..	..	..	..	..	..
1891	2,700	11,875	..	839	..	..	..	2,064	..	..	..	..
1892	1,089	12,893	..	1	..	..	..	24,356	..	..	..	..
1893	1,621	11,699	..	467	..	..	..	21,211	..	..	..	..
1894	588	16,255	..	285	..	..	..	52,947	..	..	..	..
1895	877	19,522	..	541	..	..	..	65,477	..	..	..	..
1896	892	11,810	..	669	..	..	..	71,283	..	..	17,161	..
1897	554	11,955	..	1,039	..	5,110	9,454	82,892	2,035	8,686	74,556	4,159
1898	288	11,663	2,028	450	..	13,737	39,563	93,667	3,756	43,266	70,625	24,632
1899	1,123	20,526	1,956	521	419	31,995	41,570	93,518	10,880	81,817	105,689	44,524
1900	677	17,141	721	524	86	28,670	58,370	108,696	9,368	141,523	106,193	47,860
1901	663	11,320	481	64	26	21,607	77,604	144,694	9,199	198,808	142,798	29,105
1902	442	10,706	3,284	..	125	32,737	91,976	212,570	5,679	216,637	187,273	18,381
Totals	27,120	194,590	8,470	5,400	656	133,856	318,537	973,375	40,917	690,737	704,295	168,661

a. Prior to 1st May, 1898, included with Pilbara. b. Prior to 1st March, 1899, included with Ashburton. c. From 1st August, 1897.
d. Prior to 1st April, 1897, included with Murchison. e. From 1st September, 1897.

Digitized by Google

Quantity of Gold, etc.—continued.

Year.	North-East Coolgardie.	East Coolgardie. *f*	Coolgardie. *g*	Yilgarn.	Dundas. *h*	Phillips River. *i*	Donnybrook. *j*	Locality Unspecified.	Grand Total. Crude Gold.	Fine Gold.	Value.
	(crude.) ounces.	(crude.) ounces.	(crude.) ounces.	(crude.) ounces.	(crude.) ounces.	(crude.) ounces.	(crude.) ounces.	(crude.) ounces.	ounces.	ounces.	£
1886	..	..	..	..	..	..	..	..	302	270	1,148
1887	..	..	..	..	..	..	..	..	4,873	4,359	18,517
1888	..	..	..	..	..	..	..	..	3,493	3,125	13,273
1889	..	..	..	1,859	..	..	..	..	15,493	13,860	58,874
1890	..	..	..	2,277	..	..	..	..	22,806	20,402	86,663
1891	..	..	..	12,833	..	..	..	..	30,311	27,116	115,182
1892	..	..	..	21,209	..	..	..	..	59,548	53,271	226,282
1893	..	..	..	75,745	148	..	..	..	110,891	99,203	421,386
1894	..	..	105,330	31,498	228	..	..	..	207,131	185,298	787,098
1895	..	..	125,106	19,748	242	..	..	..	231,513	207,111	879,749
1896	4,113	85,287	69,135	16,565	4,350	..	..	..	281,265	251,618	1,068,807
1897	32,906	300,037	104,306	17,994	19,311	..	..	..	674,994	603,847	2,564,977
1898	125,241	450,312	127,227	11,697	32,032	..	..	..	1,050,184	939,490	3,990,699
1899	81,171	923,618	141,170	16,805	45,165	..	506	904	1,643,877	1,470,605	6,246,733
1900	52,129	810,907	119,782	29,418	40,688	..	266	7,931	1,580,950	1,414,311	6,007,610
1901	50,557	1,033,670	88,600	29,488	38,796	..	5	1,906	1,879,391	1,703,416	7,235,652
1902	54,540	1,172,405	97,477	25,878	36,211	8,576	73	2,471	2,177,441	1,871,037	7,947,662
Totals	400,657	4,776,236	978,133	313,014	217,171	8,576	850	13,212	9,974,463	8,868,339	37,670,312

f Prior to 1st May, 1896, included with Coolgardie. *g* Declared 6th April, 1894, to which date included with Yilgarn. *h* Prior to 1893, included with Yilgarn.
i Prior to 1902, included in "Locality Unspecified." *j* From 1st March, 1899

Digitized by Google

Quantity of Crude Gold, the Produce of Western Australia, received at the Perth Branch of the Royal Mint during each of the Years 1899 to 1902, distinguishing Goldfields from which received.

Goldfield.	1899.*	1900.	1901.	1902.	Total.
	ozs.	ozs.	ozs.	ozs.	ozs.
Kimberley	308	644	663	440	2,055
Pilbara	530	7,494	11,280	10,706	30,010
West Pilbara	..	137	394	3,284	3,815
Ashburton	282	474	55	..	811
Gascoyne	86	86	19	125	316
Peak Hill	16,274	18,019	21,351	32,637	88,281
East Murchison ..	3,758	32,050	44,747	62,358	142,913
Murchison	24,676	48,540	43,025	47,628	163,869
Yalgoo	5,190	8,852	9,191	5,117	28,350
Mount Margaret ..	16,912	67,748	126,704	144,663	356,027
North Coolgardie ..	44,779	88,688	135,493	182,543	451,503
Broad Arrow	8,503	14,376	18,829	15,903	57,611
North-East Coolgardie	16,701	40,503	43,056	53,902	154,162
East Coolgardie ..	33,051	139,846	263,515	636,537	1,072,949
Coolgardie	27,611	51,607	78,026	94,134	251,378
Yilgarn	9,071	28,649	29,434	25,874	93,028
Dundas	474	31,583	32,826	31,089	95,972
Phillips River ‡ ..	..	..	..	5,147	5,147
Donnybrook	196	266	5	67	534
Locality unspecified ..	904	1,621	1,668	2,462	6,655
Grand Total ..	209,306	581,183	860,281	1,354,616	3,005,386
Percentage of total output	†18·11	36·76	45·77	62·21	30·13
Value in sterling ..	£762,547	£2,096,213	£3,033,311	£4,791,304	£10,683,375
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Average value per oz.	3 12 10	3 12 2	3 10 6	3 10 9	3 11 1
Coin and Bullion issued from the Mint ..	£690,992	£1,945,777	£2,910,525	£4,675,109	£10,222,403

* Operations commenced in May, 1899. † Percentage of total output from middle of May to 31st December. ‡ Prior to 1902, included in "Locality Unspecified."

Machinery and Plant employed in Mining (other than Gold) in Western Australia, 1900 and 1901.

Mineral.	Field or District.	Estimated Value of Plant.		
		Government Public Batteries (1901).	Total Government and Private Machinery.	
			1900.	1901
		£	£	£
Tin	Greenbushes Mining District ..	..	6,165	11,040
	Government Tin-dressing Plant	2,409	..	
	Marble Bar District	..	1,085	664
	Total Tin-mining	2,409	7,250	11,704
Copper	Mt. Malcolm District ..	..	7,077	10,165
	West Pilbara Goldfield ..	..	1,910	1,165
	Total Copper-mining ..	..	8,987	11,330
Coal ..	Collie River District	..	12,445	18,399
	Total machinery	2,409	28,682	41,433

Digitized by Google

Ore and Minerals, other than Gold, produced in Western Australia, as reported to the Mines Department during 1901 and 1902; also production previous to 1901.

Goldfield or Mining District	Locality.	Previous to 1901.*		During 1901.		During 1902.		Total.	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		tons.	£	tons.	£	tons.	£	tons.	£
				BLACK TIN.					
Greenbushes Mining District	Greenbushes ..	2,303·27	117,294	321·34	18,852	403·21	24,680	3,027·82	160,826
Marble Bar District	Marble Bar ..	520·82	35,205	412·98	21,148	216·35	15,103	1,150·15	71,456
Total, Black Tin ..	.. ..	2,824·09	152,499	734·32	40,000	619·56	39,783	4,177·97	232,282
				COPPER ORE.					
Day Dawn District	Day Dawn	5·15	91	10·50	76	..	..	15·65	167
Mt. Malcolm District	Murrin Murrin ..	4,812·00	35,056	7,660·00	40,738	1,954·00	6,852	14,426·00	82,646
Northampton Mining District	Arrino	10·00	80	..	..	..	..	10·00	80
	Geraldine	98·00	1,715	38·50	277	..	..	136·50	1,992
	Yandanooka ..	28·00	327	..	..	..	..	28·00	327
Phillips River Goldfield ..	Harbour View ..	23·00	469	219·95	2,620	277·25	848	520·20	3,937
	Mt. Desmond ..	..	..	616·45	7,783	12·50	190	628·95	7,973
	Mt. Stennett ..	..	..	32·00	430	..	..	32·00	430
	Ravensthorpe ..	11·00	256	220·74	2,085	18·50	200	250·24	2,541
West Pilbara Goldfield ..	Croydon	493·00	6,188	..	..	..	..	493·00	6,188
	Egina	530·00	6,571	..	..	..	..	530·00	6,571
	Roebourne	159·00	2,459	22·00	287	..	..	181·00	2,746
	Whim Creek ..	9,996·00	81,669	1,140·00	15,604	..	..	11,136·00	97,273
Total, Copper Ore ..	.. ..	16,165·15	134,881	9,960·14	69,900	2,262·25	8,090	28,387·54	212,871
				IRONSTONE.					
West Pilbara	Whim Creek ..	100·00	300	..	..	..	..	100·00	300
East Coolgardie Goldfield ..	Boulder	..	..	450·00	247	..	..	450·00	247
Sundry Localities	Avon	12,251·00	9,258	9,972·00	6,983	..	..	22,223·00	16,241
	Clackline	1,540·00	1,071	7,422·00	3,930	2,845·00	1,209	11,807·00	6,210
	Coates' Paddock ..	4,712·00	3,277	..	..	..	..	4,712·00	3,277
	Greenbushes ..	2,000·00	1,391	2,725·00	2,086	1,955·00	831	6,680·00	4,308
	Werribee	4,600·00	3,200	..	..	..	..	4,600·00	3,200
Total, Ironstone ..	.. ..	25,203·00	18,497	20,569·00	13,246	4,800·00	2,040	50,572·00	33,783

Digitized by Google

				LEAD ORE.					
Ashburton Goldfield	Rainbow Silver Mine	..	..	9·09	109	18·76	206	27·85	315
Northampton Mining District	Narra Tarra ..	225·00	185	..	..	..	..	225·00	185
	Northampton ..	106·75	1,048	..	..	..	..	106·75	1,048
	Victoria	19·00	212	..	..	..	..	19·00	212
Total, Lead Ore ..	.. ..	350·75	1,445	9·09	109	18·76	206	378·60	1,760
				COAL.					
Collie River Coal Mining District	Collie	176,254·10	82,547	117,835·80	68,561	140,883·90	86,188	434,973·80	237,296
				LIMESTONE.					
Yilgarn Goldfield	Southern Cross ..	269·85	273	1,642·00	919	535·00	340	2,446·85	1,532
Sundry Localities	Fremantle† ..	33,250 00	6,159	16,568·00	3,429	4,545·35	1,000	54,363·35	10,588
Total, Limestone ..	.. ..	33,519·85	6,432	18,210·00	4,348	5,080·35	1,340	56,810·20	12,120
				DIAMONDS.					
Nullagine District	Nullagine	.	24	..	..	..	..	..	24
				SILVER					
		ozs		ozs		ozs.		ozs.	
Ashburton Goldfield	Rainbow Silver Mine	..	..	356·26	43	626·00	71	982·26	114

*Containing only such quantities as were *reported to the Mines Department.* † Or flux received at Fremantle Smelting Works.

Digitized by Google

Mining Accidents on the Western Australian Goldfields, Mining Districts, and Coalfield during the Year 1901.

Goldfield or District.	Cause of Death or Injury sustained.										Total.	
	By Explosives.		By falls of ground.		Accidents in shafts.		Other Accidents underground.		Accidents on surface.			
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Kimberley	..	..	..	..	..	..	..	..	..	..	..	..
Pilbara	..	..	..	1	..	..	..	..	..	..	..	1
West Pilbara	..	..	..	..	..	..	..	..	..	..	..	..
Ashburton	..	..	..	..	..	..	..	..	..	..	..	..
Gascoyne	..	..	..	..	..	..	..	..	..	..	..	..
Peak Hill	1	..	1	1	1	2	..	1	..	..	3	4
East Murchison	1	1	1	..	1	3	..	3	..	3	3	10
Murchison	1	3	3	4	4	5	..	1	..	3	8	16
Yalgoo	..	..	..	..	..	..	..	..	..	..	..	..
Mount Margaret	1	1	4	2	1	2	..	2	..	3	6	10
North Coolgardie	3	2	4	..	1	2	..	3	1	..	9	7
Broad Arrow	..	..	1	2	..	..	..	..	..	..	1	2
North-East Coolgardie	..	..	..	..	..	2	..	1	..	..	..	3
East Coolgardie	4	7	1	5	4	14	1	7	1	12	11	45
Coolgardie	..	..	1	3	1	3	..	8	1	3	3	17
Yilgarn	..	..	..	1	..	..	..	1	..	1	..	3
Dundas	..	..	..	..	..	1	..	4	..	..	..	5
Donnybrook	..	..	..	..	1	..	..	..	..	..	1	..
Phillips River	..	..	..	..	..	..	..	..	..	..	..	..
Northampton	..	..	..	..	..	..	..	..	..	..	..	..
Greenbushes	..	..	..	..	..	..	..	..	..	..	..	..
Collie	..	1	..	5	..	..	..	..	..	1	..	7
Total	11	15	16	24	14	34	1	31	3	26	45	130

Digitized by Google

Summary of Mining Accidents in Western Australia during the Years 1897-1901, inclusive.

Goldfield or District.	1897.		1898.		1899.		1900.		1901.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Kimberley			..	..	..	..	..	..	..	..
Pilbara			..	..	1	1	..	..	..	1
West Pilbara	2	1	..	1	..	..	..	..	..	..
Ashburton			..	..	..	..	..	..	..	..
Gascoyne *a*			..	..	..	..	..	..	..	..
Peak Hill *b*			..	1	..	2	..	7	3	4
East Murchison	4	15	..	..	1	5	..	9	3	10
Murchison			5	11	3	9	3	10	8	16
Yalgoo			..	..	4	1	..	5	..	..
Mount Margaret *c*			1	6	6	4	4	10	6	10
North Coolgardie			3	1	2	14	8	10	9	7
Broad Arrow			3	6	3	6	5	5	1	2
North-East Coolgardie			2	4	3	8	4	5	..	3
East Coolgardie	24	75	15	26	14	29	14	44	11	45
Coolgardie			2	14	5	6	4	11	3	17
Yilgarn			..	8	2	3	1	14	.	8
Dundas			..	1	..	7	1	11	..	5
Donnybrook *d*	..	..	..	..	..	..	1	..	1	..
Phillips River *e*	..	..	..	..	..	..	..	..	..	..
Northampton	..	..	..	..	..	..	..	..	..	..
Greenbushes	..	..	..	..	..	1	..	1	..	..
Collie	..	..	..	..	1	5	..	2	..	7
Total	30	91	31	77	45	101	45	134	45	130

a Proclaimed a goldfield, 25th June, 1897, to take effect from 15th April, 1897. *b* Proclaimed a goldfield, 19th March, 1897, to take effect from 1st April, 1897. *c* Proclaimed a goldfield 12th March, 1897, to take effect from 1st April, 1897. *d* Proclaimed a goldfield 17th November, 1899, to take effect from 27th November, 1899. *e* Proclaimed a goldfield 21st September, 1900, to take effect from 14th September, 1900.

Digitized by Google

GOLD MINING DIVIDENDS.

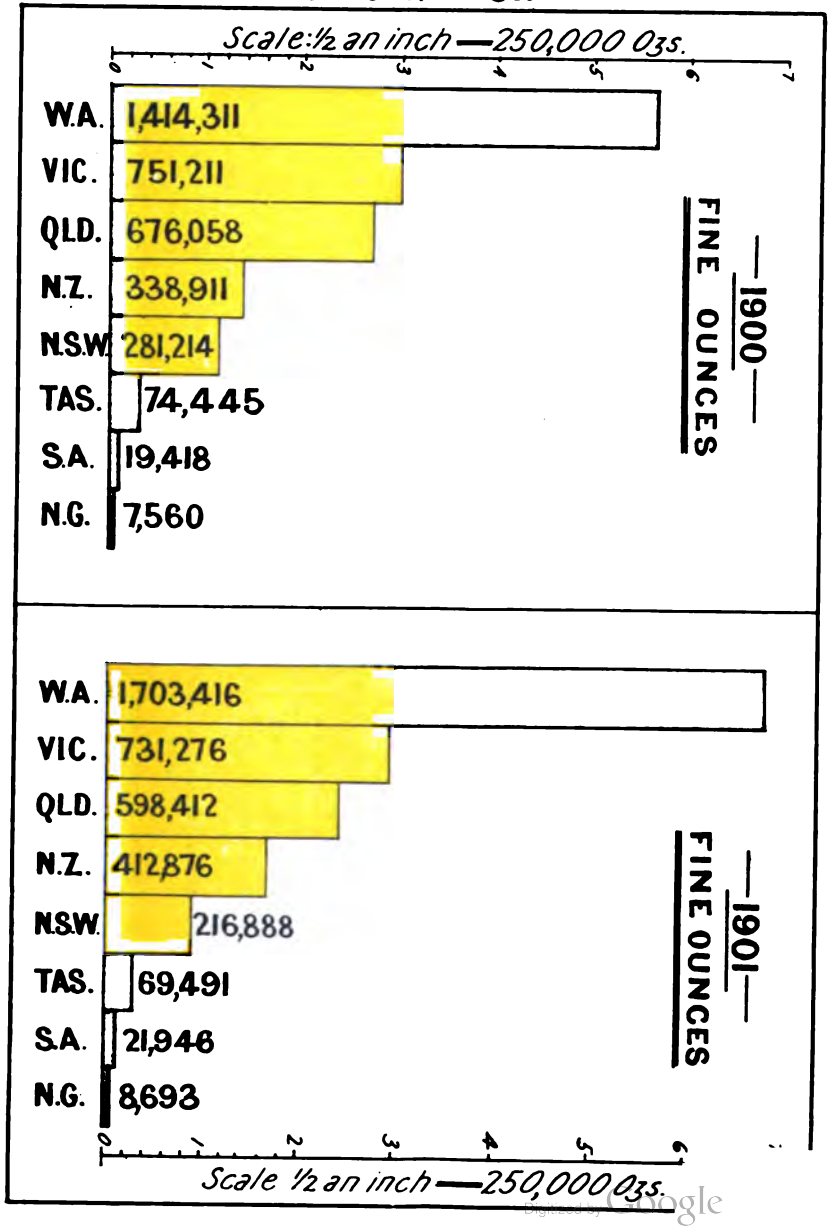
The first record of any dividend being declared from gold won in Western Australia dates back to 1890, in which year "Fraser's" Gold Mining Company at Southern Cross, Yilgarn paid £1,250. The next mine yielding dividends was the "Central," on the same field, which, in 1891, paid £3,451. Dividends assumed larger proportions in 1893, when "Bayley's Reward" at Coolgardie, paid £30,600, whilst the same mine, in 1894, paid £96,000. Other mines then came into prominence, and "The Great Boulder Proprietary," in 1895, paid £48,000. From that year up to the present, the other great companies fell into line, and the total payments for 1899 amounted to £2,057,421, of which amount "Lake View Consols" contributed £625,000. The dividends since that year have not been quite as phenomenal. Yet in 1900 they amounted to £1,392,866; in 1901 to £1,093,605; in 1902 to £1,424,272, and in 1903 to £1,988,755. Their grand total from 1890 to the 31st of December, 1903, was £9,474,617.

The total for the year 1902, £1,424,272, was made up by the companies and in the manner shown hereunder:—

Goldfield.	Name of Company.	Dividends, 1902.
		£
Murchison ..	Great Fingall Consolidated	143,750
	Island Eureka	10,667
Mount Margaret ..	Westralia Mount Morgans	61,327
	Ida H. (Laverton)	12,406
	Lancefield	4,320
North Coolgardie	Cosmopolitan	10,000
	Queensland Menzies	9,900
	Lady Shenton	8,000
N.E. Coolgardie ..	White Feather Main Reef	8,000
East Coolgardie	Great Boulder Perseverance	350,000
	Golden Horseshoe	270,000
	Great Boulder Proprietary	218,750
	Ivanhoe Gold Corporation	130,000
	Associated Northern	87,500
	Hannan's Oroya-Brown Hill	45,000
	Kalgurli	15,000
Coolgardie	Burbank's Birthday Gift	22,500
	Lady Robinson	1,152
Dundas	Princess Royal	16,000
	Total	£1,424,272

Digitized by Google

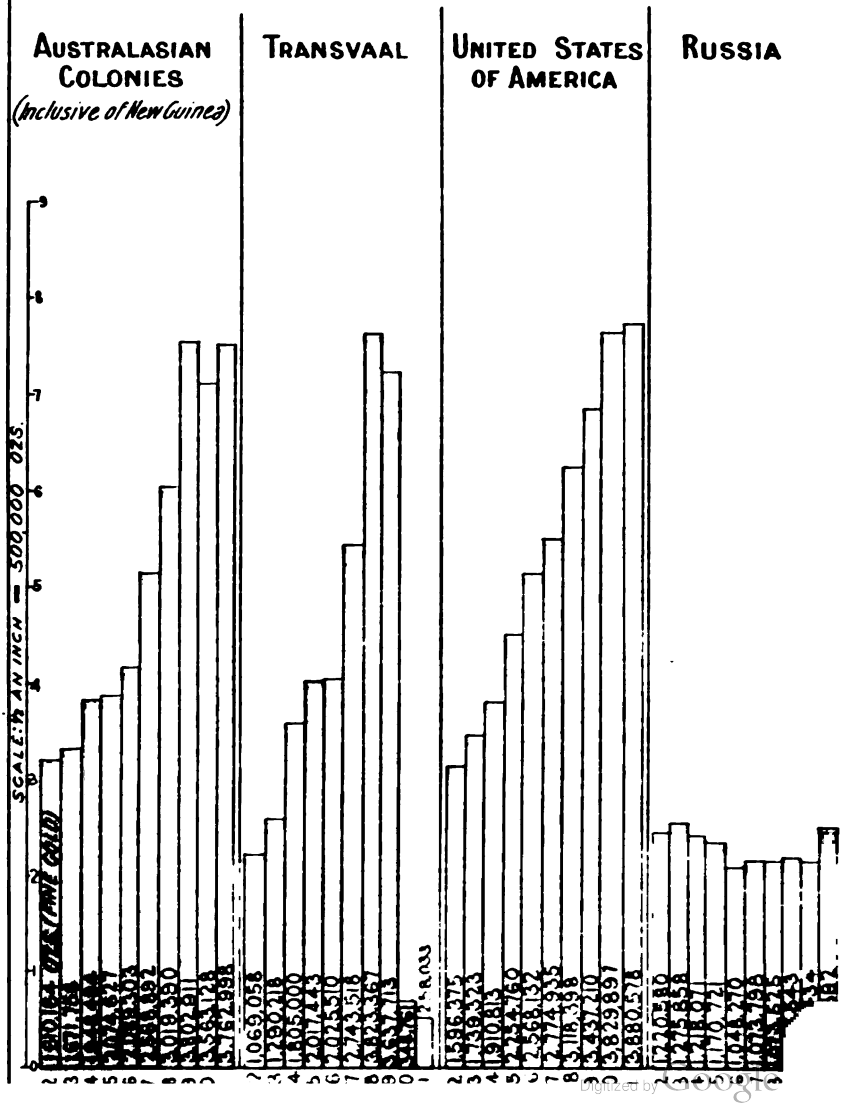
GOLD YIELD OF AUSTRALASIA
1900 & 1901.



Digitized by Google

Digitized by Google

GOLD YIELD OF THE PRINCIPAL GOLD PRODUCING COUNTRIES OF THE WORLD



Digitized by Google

Digitized by Google

The total for the year 1903, £1,[illegible],700, was made up by the Companies and in the manner following:

Goldfield.	Name of Company	Dividends
Peak Hill	Peak Hill	[illegible]
Murchison	Great Fingall Consolidated	[illegible]
	Inland Burbank	[illegible]
Mount Margaret	Isis N. Clarendon	[illegible]
	Lancefield	[illegible]
	Mount A. Gwalia	[illegible]
North Coolgardie	Westralia M. Mining	[illegible]
	[illegible]	[illegible]
N.E. Coolgardie	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
East Coolgardie	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]

Gold Production of the World for each of the Ten Years, 1893-1902.

Countries and Continents.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	Total Gold Production for the Ten years.	
	Fine Gold.	Fine Gold.	Fine Gold.	Fine Gold.	Fine Gold.	Fine Gold.	Fine Gold.	Fine Gold.	Fine Gold.	Fine Gold.	Fine Gold.	Value.
	Ounces.	Ounces.	Ounces.	Ounces.	Ounces.	Ounces.	Ounces.	Ounces.	Ounces.	Ounces.	Ounces.	£
AUSTRALASIA.												
Western Australia ..	99,203	185,298	207,111	251,618	603,847	939,490	1,470,605	1,414,311	1,703,416	1,871,038	8,745,937	37,150,379
Victoria	631,986	675,141	696,924	758,134	765,365	788,429	804,665	760,319	730,450	720,862	7,332,275	31,145,524
Queensland	508,340	559,897	506,286	502,160	601,060	647,487	668,150	676,058	598,412	640,493	5,908,343	25,097,044
New Zealand	214,971	209,015	273,596	245,173	230,759	254,416	356,231	338,911	412,876	459,406	2,995,354	12,723,451
New South Wales ..	153,326	272,314	309,796	252,690	259,978	282,914	382,162	252,116	173,543	161,256	2,500,095	10,619,724
Tasmania	34,342	53,084	49,986	55,930	68,093	66,267	77,111	74,444	69,490	70,996	619,743	2,632,501
South Australia ..	28,413	33,689	30,340	22,497	28,280	22,474	18,633	19,418	21,946	22,395	248,085	1,053,798
New Guinea *a* ..	526	920	604	1,115	5,890	5,627	10,402	7,560	8,693	*d*8,693	50,030	212,514
Total ounces ..	1,671,107	1,989,358	2,074,643	2,089,317	2,563,272	3,007,104	3,787,959	3,543,137	3,718,826	3,955,139	28,399,862	120,634,946
AFRICA.												
Transvaal Colony ..	1,290,218	1,805,000	2,017,443	2,025,510	2,743,518	3,823,367	3,637,713	348,761	231,076	1,718,921	19,641,527	83,431,903
Other Countries ..	24,770	24,674	27,966	34,069	34,345	41,941	83,941	130,426	203,133	230,982	836,247	3,552,151
Total ounces ..	1,314,988	1,829,674	2,045,409	2,059,579	2,777,863	3,865,308	3,721,654	479,187	434,209	1,949,903	20,477,774	86,984,054
AMERICA.												
U. S. of America ..	1,739,323	1,910,813	2,254,760	2,568,132	2,774,935	3,118,398	3,437,210	3,829,897	3,805,500	3,870,000	29,308,968	124,496,583
Canada	47,247	54,605	100,806	133,274	291,582	666,445	1,028,620	1,350,176	1,167,320	1,032,253	5,872,328	24,944,064
Mexico	*a*78,995	*a*301,132	*a*386,212	*a*435,470	*a* 481,362	587,548	281,471	264,142	442,694	482,244	3,741,270	15,891,905
Other Countries ..	461,573	652,130	513,412	503,072	480,158	508,787	559,866	564,131	660,248	628,405	5,531,782	23,497,515
Total ounces ..	2,327,138	2,918,680	3,255,190	3,639,948	4,028,037	4,881,178	5,307,167	6,008,346	6,075,762	6,012,902	44,454,348	188,830,067
EUROPE.												
Russia *b*	1,275,858	1,218,071	1,170,721	1,048,270	1,073,798	1,073,525	1,083,543	1,082,499	1,105,412	*d*1,105,412	11,237,109	47,732,205
Other Countries ..	72,185	107,628	116,537	121,223	119,442	104,585	113,752	127,557	118,140	120,115	1,121,164	4,762,402
Total ounces ..	1,348,043	1,325,699	1,287,258	1,169,493	1,193,240	1,178,110	1,197,295	1,210,056	1,223,552	1,225,527	12,358,273	52,494,607

Digitized by Google

Asia.												
British India	184,837	187,683	230,726	291,715	352,048	377,358	405,753	445,381	454,523	463,834	3,393,858	14,416,193
China	*a* 326,091	*a* 481,204	*a* 254,960	*a* 318,166	*a* 298,486	*a* 261,655	*c* 270,720	*d* 251,092	*a* 231,465	287,996	2,981,835	12,666,030
Other Countries ..	62,487	59,427	78,082	86,074	107,895	115,902	154,301	205,303	277,281	276,057	1,422,809	6,043,709
Total ounces ..	573,415	728,314	563,768	695,955	758,429	754,915	830,774	901,776	963,269	1,027,887	7,798,502	33,125,932
The World. Total ounces ..	7,234,691	8,791,725	9,226,268	9,654,292	11,320,841	13,686,615	14,844,849	12,142,502	12,415,618	14,171,358	113,488,759	Ozs. of fine gold.
Value £ sterling ..	30,731,014	37,344,874	39,190,695	41,008,826	48,087,876	58,137,045	63,056,910	51,578,070	52,738,193	60,196,103	482,069,606	£ sterling.

a Twelve months ended 30th of June. *b* Including gold from Siberia. *c* Gold on which Export Duty was paid. *d*. Estimated.

Digitized by Google

4.—THE TIMBER TRADE.

From the statistical figures relating to the local timber production, as shown in the tables below, enough can be learned to gauge the importance of this industry, the steady rate at which it is being developed, and its value as a national asset; and it is gratifying to reflect that, while there is a continued local demand, at the same time the foreign trade shows an almost constant increase from year to year. In 1898 the exports of timber were valued at £326,195. In 1899 the figures were £553,198. There was a temporary falling off in 1900, the figures being £458,864; but in 1901 they rose to £572,354. The demand for Western Australian hardwoods for railway sleepers, street paving blocks, and piles for wharves and piers is still on the increase; the exports to the United Kingdom in 1900 were 46,866 loads; in 1901 they amounted to 62,726 loads.

Western Australian Forest Saw-mills cutting Native Timber, 1901.

District (Electoral).	Forest Saw-mills.*	Persons employed.			Horse-power of Engines.				Average Time in operation during the Year.	Horses and Bullocks employed.		Length of Railway & Tramway belonging to the Saw-mills.	Quantity of Timber sawn during the Year.	Approximate Value of		Amount of Salaries and Wages paid during the Year.
		Working Proprietors.	Employees.	Total.	Steam. Noml.	Gas. Brake.	Oil. Brake.	Electric Motor. E.H.P.		Horses.	Bullocks.			Land and Buildings.	Plant and Machinery.	
	No.	No.	No.	No.	H.P.	H.P.	H.P.	H.P.	Months.	No.	No.	Miles.	Super. ft.	£	£	£
Murray ..	3	3	771	774	562	..	..	..	11·88	318	138	83	30,379,800	31,000	147,700	96,807
Nelson ..	4	5	90	95	91	..	..	..	9·53	45	46	4¼	4,063,920	1,310	16,550	9,831
Sussex ..	2	..	512	512	515	..	..	..	12·00	220	46	63½	12,747,064	25,170	138,375	59,663
Swan	5	1	229	230	92	..	..	..	10·70	88	..	39	7,028,433	‡4,580	‡5,350	26,179
Wellington ..	6	1	1,025	1,026	1,338	..	..	..	11·78	427	116	72½	47,668,666	‡32,740	‡116,200	135,715
Bunbury ..	1															
Plantagenet ..	1	†1	416	417	272	..	7	..	11·79	207	197	55½	20,525,982	12,500	146,200	58,678
South-West Mining	1															
Total ..	23	11	3,043	3,054	2,870	..	7	..	11·69	1,305	543	318	122,413,865	‡107,300	‡570,375	386,873

* All the establishments used machinery worked by steam or oil. † These particulars have been combined in order to conceal the contents of individual schedules, in compliance with the provisions of "The Industrial Statistics Act, 1897," Section 18. ‡ These returns are incomplete, the figures for two mills not being available.

Digitized by Google

The above table gives particulars of the working and the output of the Western Australian forest saw-mills for the year 1901, the figures being those relative to the various timber-producing districts. The following statement contains the totals for the whole State for each of the five years, 1897 to 1901.

Forest Saw-mills cutting Native Timber, 1897 to 1901.

Year.	Forest Saw-mills.*	Persons employed.	Horse-power of Engines.				Average Time in Operation during the Year.	Horses and Bullocks employed.		Length of Railway or Tramway belonging to the Saw-mills.	Quantity of Timber sawn during the Year.	Approximate Value of	
			Steam. Noml.	Gas. Brake.	Oil. Brake.	Electric Motor. E.H.P.		Horses.	Bullocks.			Land and Buildings.	Plant and Machinery.
	No.	No.	H.P.	H.P.	H.P.	H.P.	Months.	No.	No.	Miles.	Super. ft.	£	£
1897 .. .	35	2,807	3,854	..	..	..	10·23	†954	†445	†152	†85,052,976	†229,135a	† 324,600
1898	35	2,961	3,969	..	11	..	8·24	1,410	905	273	103,042,991	† 397,220a	† 473,758
1899	25	2,799	3,616	..	11	..	11·56	1,825	814	275	118,051,861	† 90,685	† 462,723
1900	22	2,931	3,481	..	11	..	11·52	1,190	545	290‡	112,693,000	† 122,863	† 497,500
1901	23	3,054	2,870	..	7	..	11·69	1,305	543	318	122,413,865	‡ 107,300	‡ 570,375

* All the establishments used machinery worked by steam or oil.

† These returns are incomplete, the figures for one mill not being available.

‡ These returns are incomplete, the figures for two mills not being available.

a. The figures supplied by some of the companies were excessive, owing probably to value of Timber Leases having been included.

Digitized by Google

It will be seen that, although the number of mills decreased during the five years, their aggregate output steadily increased.

During the year 1901, the aggregate number of employees in the timber mills was 3,043; the average time during which the mills were in operation was 11·69 months the amount of salaries and wages paid was £386,873. From these figures it appears that the average monthly wages of each employee were £10·88.

The exports of jarrah and karri, as will be seen from a comparative statement for the years 1900 and 1901, given hereunder, are not confined to the United Kingdom and Australasia, but extend over the most widely scattered parts of the world.

The value of a load of either of these timbers, as estimated by the Customs Department, was, for the years under consideration, £4.

Kind of Timber.	Countries to which exported.	Number of Loads. In 1900.	Number of Loads. In 1901.
Jarrah.	United Kingdom	23,148	34,147
	New South Wales	..	94
	Victoria	377	27
	South Australia	10,185	14,315
	New Zealand	43	2,322
	Singapore	4,227	1,215
	Ceylon	2,294	5,072
	India	882	6,273
	Hong Kong	40	..
	Mauritius	811	858
	Natal	5,513	14,189
	Cape Colony	12,227	13,341
	Germany	262	475
	France	7	..
	Spain	917	..
	Holland	..	5
	Java	..	5
	Sumatra	..	½
	Philippine Islands	1,003	2,092½
	China	1	984
	Japan	..	74
	Argentine	9,274	4,947
	Peru	..	1,200
	Uruguay	1,852	..
	Mexico	1,399	..
	Total	74,462	101,636
Karri.	United Kingdom	23,718	28,579
	New South Wales	201	..
	Victoria	..	656
	South Australia	372	885
	Ceylon	2,693	3,962
	India	1,269	..
	Natal	484	2,287
	Cape Colony	5,476	..
	Germany	1	..
	France	17	..
	Argentine	4,041	5,007
	Uruguay	1,268	..
	Mexico	505	..
	Total	40,045	41,376
	Total Jarrah and Karri ..	114,507	143,012
	(Value)	(£458,028)	(£572,048)

Digitized by Google

In addition to jarrah and karri, small quantities of other timbers, mostly unspecified in the Customs returns, were exported during these years; in 1900 to the value of £836, of which only £434 represented produce of the State, and in 1901 to the value of £307.

From the first settlement of Western Australia as a Colony to the end of the year 1901, a total of 914,593 loads of native timber were exported, valued at £3,710,167, to which must be added unspecified quantities of native timber to the value of £846. Of the loads specified above, 332,411 went to the United Kingdom.

The sandalwood trade was for many years one of the most important industries of Western Australia. In 1845 four tons, valued at £40, were exported; since that period, up to the end of 1901, the total shipments—principally to Singapore and China—were 199,879 tons, valued at £1,748,950. The figures for 1901 were 8,864 tons, valued at £73,931, the quantity exported to Hong Kong alone being 5,848 tons.

When it is considered that, according to the estimate of the late Conservator of Forests Ednie Brown, the area of jarrah forest in Western Australia is about 8,000,000 acres, and of karri forest about 1,200,000 acres, and that the records of the Lands Department, on 31st December, 1902, only showed an acreage of 889,540 acres of forest land under timber leases and licenses, it will be realised what scope for expansion there still is in the local timber industry. Among the timber companies at present carrying on business in Western Australia, "Millar's Karri and Jarrah Company (1902) Limited," occupies a very prominent position, having effected, under a contract of purchase and amalgamation, a combination of eight separate companies. There are, however, a certain number of independent companies outside this combine.

In 1902, the timber sawn in the various forest saw mills of the State amounted to 124,005,005 superficial feet, and the value of the timber exported was £500,533.

5.—FISHERIES.

The Chief Inspector of Fisheries, in his report for 1901, expressed his regret at being unable to arrive at a reliable estimate of the quantity of fish caught for sale during the year, throughout that portion of the State coming within the operation of the Fishery Act, owing, as he pointed out, to the want of the necessary powers to compel the passing of all fish brought into any Municipality through a market for inspection. From the returns supplied by the Railway Department, the quantity was approximated as being, at the lowest, over

Digitized by Google

1,300 tons; 930 tons having been trucked over Government railways. From the high prices realised throughout that year, the industry must have been of a very considerable value, as although the figures showed an increase of some hundreds of tons on the previous year, satisfactory prices, from a selling point of view, were obtained throughout. Much, however, still remains to be done in the way of providing quick transit from the fishing grounds to the markets before any prospect is likely to arise of fish food being sold at a more reasonable figure. During the year 218 fishing boat and 400 fishermen's licenses had been issued, the figures showing an increase of 27 fishing boats over the previous year. It is worthy of note that foreign nationalities are strongly represented in the returns of licenses issued to fishermen. For the year under consideration the figures were: Italians, 190; British, 90; Germans and Scandinavians, 64; Greeks, 22; Asiatics, 22; Austrians, 12.

During the latter part of 1901, a fish-landing stage and large shed were erected at Fremantle, and it was pointed out by the Inspector how necessary it was that these should be placed under the control of the Municipal authorities, and that By-laws should be framed with the object of concentrating the inspection of fish.

For some years there has been a general complaint throughout the State that the supply of fish has been insufficient, and far too high in price to allow it to become a staple food within the reach of all classes. The causes of this are easy to explain. The coast line from Geraldton to Albany, a distance of nearly 600 miles, is only tapped in four places by railway, some of these places being over 200 miles apart; consequently the fishing fleet have to confine their operations within reach of these termini. The distances from the populated centres to, notably, Geraldton and Albany, are so great, and the charges and freights so high, that unless fish food from these distant fishing grounds command a high price, there would be no margin of profit to the producer. In the past, too, the absence of the necessary power to bring all fish food into a common market and force its sale has kept the prices up. Cases have occurred when fishermen, not getting their own prices, took their catches out to sea and dumped them overboard.

The remedy is within reach, but it requires capital to effect it; the first consideration being the provision of quick transit from the distant fishing grounds by means of steamers fitted up with cool-storage chambers. The Government, by encouraging deep-sea trawling, would be doing valuable work in building up an important industry. Successful trawling with quick transit by steamer from the fishing fleets would mean the establishment of a regular and plentiful supply of fish for all classes at a reasonable figure. The use under present conditions also of a solution of boric acid for washing the fish, and other of the most modern means of guarding against putrefaction, deserve especial consideration in connection with the enterprise.

Digitized by Google

The industry is undoubtly feeling the benefit of the continued closure of portions of our inland waters and rivers against net fishing. It is a very difficult matter to adopt and carry out the necessary measures for the proper protection of fish and fishing grounds without causing a certain amount of dissatisfaction amongst the fishermen; but while the licensed men should be assisted and protected as far as practicable, it is absolutely necessary for the preservation of anadromous fish that portions of our inland waters and rivers should be temporarily reserved for breeding and nursery grounds.

The closure for the last few years of Safety Bay against fishing for schnapper during the schooling season of that species of fish was proclaimed with the object of allowing the fish to be undisturbed during their breeding season, as it was generally thought that Safety Bay or Warnbro Sound was the principal place where spawning operations were carried on. The evidence that has since been gathered proves, beyond doubt, however, that this species of fish, in vast numbers, visit other parts of our coast during the spawning season.

The advisableness of continuing this protection is, according to the Inspector of Fisheries, open to question, in face of the recent agreement come to by scientists that it is practically impossible to deplete the ocean of its supply of fish.

It, however, seems only reasonable to expect that the constant fishing in, and consequent disturbance of particular waters, especially if they happen to be of a confined or restricted nature, would drive the fish they contain to seek, if only temporarily, other more secluded spots, where they would not be interferred with.

The returns received from the Collector of Customs sh w a steady yearly increase in the importation of dried, salted, pickled, and preserved fish into this State. During the year 1900 1,503,089lbs. (over 671 tons), with a value of £31,957, were imported; while for the year 1901 the importation of fish food amounted to 1,795,457lbs. (over 801 tons), with a value of £36,907; showing an increase over 1900 of 292,368lbs., with a value of £5,050.

These figures should prove conclusively that there is ample scope for the investment of capital in the establishment of well-appointed canneries, as well as a regular fresh fish trade, with our populated centres. If capitalists would turn their attention towards the Northern waters of this State, investment in all branches of the fishing industry would present great possibilities of profit.

The crayfish taken from Rottnest, and liberated in Bunbury Harbour, are progressing satisfactorily, and their progeny in great numbers may be seen about the jetty piles. The waters being declared closed against cray-fishing, there is every probability that the crustacea will, in time, become firmly established. Similar experiments were made, during the early part of the year 1901, in the Swan River, in the deep waters about Blackwall Reach and Claremont, and there appears to be no reason why they should not be equally successful.

Digitized by Google

PEARL-SHELL FISHERIES.

In 1897 an Act was passed empowering the Government to extend the provisions of "The Shark Bay Pearl Shell Fisheries Act, 1896," to other waters.

The Inspector of Fisheries, in his report of 1898, stated: "The pearling banks, are, beyond doubt, recovering themselves rapidly; and in the course of a few years some of the more favourably situated should be equal to what they were 15 years ago. Cultivation of the pearl oyster has not been carried on to any great extent. The results of the experiments prove, however, that the shell of the transplanted oyster loses its bright lustre, but the progeny of the foreign bivalve appears to have become acclimatised, and the shell has all the bright lustre of the indigenous pearl oyster."

A fair estimate of the importance of the pearling industry of the State may be obtained from the following tabular statement for 1901, from which it will at once be seen that the greater portion of the pearling fleet is now almost permanently engaged in the vicinity of Broome:—

District.	Vessels.		Labour.									Quantity of Pearl Shell.		Value of Pearls.	Value of Pearl Shells.	Value of Beche-de-Mer.
					Asiatic.											
	No.	Total Tonnage.	White.	Aboriginal.	Chinese.	Japanese.	Malay.	Manilla.	Others.	Total Asiatic.	Total Labour.					
			No.	No.	No.	No.	No.	No.	No.	No.	No.	T.	cwt.	£	£	£
Broome—																
Apparatus vessels ..	178	2,830	87	27	10	249	630	279	44	1,212	1,326	643	8	26,570	88,298	..
Beach-combing ..	3	27	2	18	..	1	..	..	..	1	21	3	3	48	418	120
Cossack—																
Apparatus vessel ..	16	298	8	4	1	29	51	13	7	101	113	46	16	2,470	5,612	..
Onslow—																
Apparatus vessels ..	4	45	3	2	..	1	8	4	5	18	23	7	5	860	300	..
Shark Bay—																
Hand dredging ..	31	130	32	14	..	..	10	11	5	26	72	130	18	1,689	940	..
TOTAL	232	3,330	132	65	11	280	699	307	61	1,358	1,555	831	10	30,637	95,568	120

Digitized by Google

The progress made in the industry in the course of six years can be gauged from the comparative table for the years 1896 to 1901, in so far as complete figures for past years are available:—

Year.	Vessels.		Labour.										Quantity of Pearl Shell.		Value of Pearls.	Value of Pearl Shells.	Value of Beche-de-Mer.
					Asiatic.												
	No.	Total tonnage.	White.	Aboriginal.	Chinese.	Japanese.	Malay.	Manilla.	Others.	Total Asiatic.	Total Labour.						
			No.	No.	No.	No.	No.	No.	No.	No.	No.		T.	cwt.	£	£	£
1896	115	1,926	43	83	*	*	*	*	*	617	743		381	10	7,998	*	*
1897	151	1,851	61	95	2	144	273	150	39	608	764		430	5	8,688	46,882	1,825
1898	168	2,212	65	91	5	182	328	239	55	809	965		639	16	11,202	69,438	1,300
1899	179	2,707	80	94	14	168	481	256	72	991	1,165		720	17	15,529	80,479	488
1900	200	3,042	99	119	11	236	496	271	63	1,077	1,295		749	14	14,376	77,879	32
1901	232	3,330	132	65	11	280	699	307	61	1,358	1,555		831	10	30,637	95,568	120

* Information not available.

Digitized by Google

North-West Pearling Industry.

During the year 1901, 716 tons of shell, with a declared value of £104,990, were exported from this State. These figures show an increase of 110 tons over 1900, and an increase of £20,069 in the value. From the returns of the licensing officers at Broome, Roebourne, and Onslow, it appears that two hundred boats were licensed under "The Pearl Shell Fishery Act, 1886," representing a tonnage of about 3,255. The total number of male adults employed was, approximately, 1,345.

In a former report the Chief Inspector of Fisheries drew attention to the very small annual revenue derived directly from this industry; also the necessity of consolidating the Pearling Acts at present in force. Although a Bill was framed and printed, it was deemed advisable by the Government, owing to the Immigration Restriction Bill being before the Federal Parliament, to withhold the Pearling Bill until it was known what powers the State had in dealing with coloured labour. The fee of £1 per boat engaged in the industry is still in force, and a revenue of £200 was collected in 1901, while the export value of shells obtained was £104,990. These figures are exclusive of the value of pearls, which may be approximately put down at £30,000. It will thus be seen that the industry represents a very considerable value, and one from which might fairly be expected a larger direct revenue than is at present received.

Prior to the year 1890, under "The Pearl Shell Fishery Act, 1886," there was an export duty of £4 per ton on shell—which was reduced to £2 by "The Pearl Shell Duty Reduction Act, 1889," and repealed in 1895. From 1890 to 1895 the revenue derived, exclusive of pearling licenses, was approximately £6,644. The revenue since received, to the end of 1901, £800, was derived from boat licenses.

When a comparison is made between the export value of £104,990 and the direct revenue of £200 received during the year, it must be acknowledged that the pearlers have been most leniently treated with regard to taxation since the export duty on shell was finally repealed.

Shark Bay Pearling Industry.

As compared with the above, the Inspector's report shows that 26 boats, employing 58 adults, were engaged in the industry at Shark Bay during 1901. A total of 129 tons of shell were exported, with a declared value of £972; the value of pearls obtained from this quantity of shell may be approximately put at £1,028, making a total of £2,000. The revenue received was £275. The price of shell from Shark Bay has not materially increased of late, consequently the industry is not in such a flourishing condition as could be wished. The banks, however, are steadily recovering themselves, and in many parts of Shark Bay should, before many years have passed, be fully stocked with shell.

Special reference to the Bêche-de-mer, Turtle, Dugong, and Oyster Fisheries on the North-West coast will be found in the chapter on Fish and Fisheries in Vol. I. (p.p. 275 to 285).

Digitized by Google

6.—FACTORIES AND INDUSTRIAL ESTABLISHMENTS.*

In view of the fact that the principal expansion of Western Australia is of very recent date, it is but natural to expect that those industries which do not directly deal with her most important resources, are unlikely to have as yet received the same attention as would naturally be the case in older settled communities. Nevertheless, it would be misleading to speak of her manufactories as being wholly undeveloped or insignificant. Indeed, under the circumstances, the amount of industrial activity already displayed, outside the avenues of the direct exploitation of the soil, bears most favourable testimony to local enterprise. As to this, a glance at the output of the principal manufacturing establishments of the State, during the years 1897 to 1902, should convince the most sceptical:—

Factories, etc.	Articles, etc., Produced or Treated.		1897.	1898.	1899.	1900.	1901.	1902.
Tanneries	Hides tanned	number	13,020	11,620	10,200	11,195	12,852	10,730
	Skins tanned	number	†	7,000	6,632	9,810	11,450	6,100
Flour Mills	Wheat ground	bushels	365,942	438,265	490,035	626,042	493,263	576,781
	Flour made	tons	7,314	8,460	10,042	12,539	10,278	11,840
Aerated Water and Cordial Factories	Aerated Waters made ..	dozens	1,061,178	890,135	1,085,922	1,201,029	1,084,852	1,229,786
	Cordials made	dozens	19,499	15,892	16,163	29,875	17,307	16,027
Breweries	Beer and Stout made ..	gallons	2,817,982	3,278,008	3,373,642	4,015,490	4,225,037	4,780,058
Boot Factories	Boots and shoes made ..	pairs	171,307	207,957	217,416	249,786	264,768	212,768
Brickworks	Bricks made	number	36,564,400	26,810,900	18,564,710	25,234,084	30,160,162	37,721,897
Electric Light Works ..	Light supplied	Brit. units	230,180	459,847	618,349	948,370	1,243,405	2,163,208
Gas Works	Gas supplied	cubic feet	52,810,290	56,988,680	48,806,400	59,977,130	52,203,900	52,423,870
Soap and Candle Works	Soap made	cwt.	19,175	20,381	21,460	24,520	20,315	22,782
	Candles made	lbs.	765,135	1,169,475	1,881,600	1,828,499	1,737,292	1,866,725
Tobacco and Cigar Factories	Tobacco made	lbs.	83,600	67,477	78,155	100,448	115,855	94,393
	Cigars made	number	840,400	583,275	694,650	1,045,900	1,140,611	1,054,975
		lbs.	7,826	6,985	8,712	13,063	14,263	13,832
	Cigarettes made	number	2,909,000	585,000	1,056,000	1,588,000	4,206,000	2,804,000
		lbs.	6,545	1,316	2,640	4,367	10,500	6,758

* For particulars relating to the timber industry see special chapter on that subject. † No information available.

Digitized by Google

In addition to the products for the year 1901, shown in the table, a total of 282,900 bushels of bran and 157,520 bushels of pollard were made in the flour mills; 12,851 pairs of boot and shoe uppers for other than factory use in the boot factories; articles of pottery to the value of £1,815 in the brickworks; and 2,805 tons of coke in the gasworks.

The principal increases are observable in the productiveness of breweries, boot factories, electric light works, candle works, and tobacco and cigar factories.

In dealing with the figures relating to Western Australian industries, it must be borne in mind that those collected by the Statistical Department only refer to industrial establishments coming under the definition given in the Industrial Statistics Act, each being a "factory, workshop, or mill, where either four persons or more have "been employed at any one time during the year, or where an engine, "driven by steam, gas, oil, or electricity has been used, whatever be the "number of persons employed." The returns furnished under the provisions of this Act showed a total number of industrial establishments in the year 1901 of 662, as against 632 in 1900. In these were employed 11,108 male, and 1,090 female workers, as against 10,261 males and 905 females in the previous year. The greater number of the female workers found employment in the manufacture of clothing and textile fabrics, 423 being, during 1901, engaged in tailoring establishments, 332 in dressmaking and millinery establishments, and 66 in boot and shoe factories, making a total of 821 out of 1,090 female workers returned for that year. Of the remainder, 74 were engaged in printing and bookbinding works, 38 in tobacco and cigar works, 32 in confectionery works, 20 in manufacturing chemists' establishments, 16 in photographic establishments, 15 in cardboard and paper box-making establishments, and the other 74 in various trades. Of the men, no less than 4,320 of the total number of 11,108 were engaged in the production of building materials, viz., 3,050 in forest sawmills, 629 in sawmills in the towns and in joinery works, 358 in brickworks, 253 in quarries and lime works, and 30 in glazing establishments and paint works. The number of men employed in engineering works, iron works, foundries, plumbing and tinsmithing establishments was 1,299. In railway and tramway workshops there were 948, in electrical engineering works 100, and in agricultural implements works 47. In breweries the men employed numbered 390, in aerated water and cordial factories 311, in water condensing works 205; in wine-making establishments, 34; in tailoring establishments, 347; in boot and shoe factories, 286; in bakeries, 330; in flour mills, 131; in ice and refrigerating works, 63; in confectionery works, 45; in other establishments connected with the preparation of food and drink, 74; in tanneries, 42; in printing and bookbinding works, 789, in coach and wagon building and blacksmithing establishments, 316; in saddlery and harness-making

Digitized by Google

establishments, 119; in furniture and bedding factories, 219; in firewood yards, 119; in electric light and power works, 110; in gas works, 54; in boat-building works 44; in cycle works, 32; in soap and candleworks ,67; in tobacco and cigar works, 55; and in various other works, 212.

Of the total number of persons employed, 616 males and 33 females were working proprietors; 422 males and 16 females were managers and overseers; 423 males and 25 females were accountants and clerks; 425 males were engine-drivers and firemen; 6,417 males and 1,012 females were workers in factory, mill, or workshop; 1,989 males were general labourers; 693 males were carters and messengers, and the remaining 123 males and 4 females were otherwise engaged in connection with some of the establishments. The number of males employed under 15 years of age was 103; that of the females 22. Employed at home, but working for some of the establishments, were 13 males, and 34 females. The total amount of salaries and wages paid during the year was £1,455,210.

The number of industrial establishments in the Perth district alone was 145; in East Perth it was 20; in North Perth, 18; West Perth, 31; South Perth, 6; Guildford, 20; in the Swan district, 16; at Fremantle, 36; at East Fremantle, 15; at South Fremantle, 16; at North Fremantle, 9; at Kalgoorlie, 47; at Boulder, 32; at Hannans, 32; at Coolgardie, 32; while the remaining 187 establishments were to be found scattered over the various other districts of Western Australia.

Machinery worked by steam, gas, oil, or electricity, was used in 333 of the 662 establishments. The total horse-power of the aggregate steam-engines employed was 8,683, that of the gas engines, 87; of the oil engines 468; and that of the electric engines 289.

Particulars relating to the employment of labour and machinery, and approximate value of land, buildings, plant, and machinery used in connection with the industrial establishments during 1901, are given in the following table, distinguishing the various classes of industry.

Digitized by Google

Industrial Establishments, 1901.

Class of Industry.	Number of Establishments.	Working Proprietors, Managers, and Overseers.		Accountants and Clerks.		Engine-drivers and Firemen.	Workers in Factory, Mill, or Workshop.		General Labourers.	Carters, Messengers, etc.		Motive Power employed. Horse Power of				Approximate Value of	
		Males.	Females.	Males.	Females.	Males.	Males.	Females.	Males.	Males.	Females.	Steam Engines.	Gas Engines.	Oil Engines.	Electric Motors.	Land and Buildings.	Plant and Machinery.
																£	£
Treating raw material, the product of pastoral pursuits	8	11	..	3	..	4	36	..	2	6	..	72	..	..	..	11,980	5,330
Connected with food and drink, or the preparation thereof { Food	86	113	4	42	4	42	251	58	44	151	..	569	16	..	12	153,740	83,481
Connected with food and drink, or the preparation thereof { Drink	118	170	3	47	2	100	364	..	92	167	..	818	9	29	14	191,589	156,857
Clothing and textile fabrics	106	110	33	15	2	2	485	783	1	20	3	10	..	24	..	150,631	13,109
Building materials	100	217	..	137	4	152	2,295	1	1,222	297	1	3,602	..	74	10	*235,050	*656,775
Metal works, machinery, etc. ..	57	122	..	69	3	59	1,614	5	490	40	..	647	..	109	53	181,920	221,943
Boatbuilding, repairing, etc. ..	5	9	..	..	..	1	28	..	6	..	..	8	..	13	2	1,780	3,975
Furniture, bedding, etc.	17	29	..	7	..	1	173	10	3	6	..	4	4	4	11	26,160	2,270
Books, paper, printing, etc.	44	84	6	56	5	11	591	78	9	41	..	23	39	114	130	148,295	122,514
Vehicles, saddlery, harness, etc. ..	49	68	..	17	..	1	360	4	8	13	..	31	9	13	8	64,890	16,993
Heat, light, and energy	39	50	..	15	3	45	58	..	66	49	..	2,781	5	66	46	46,660	151,101
Miscellaneous	33	55	3	15	2	7	162	73	46	26	..	118	5	22	3	60,365	29,470
Total	662	1,038	49	423	25	425	6,417	1,012	1,989	816	4	8,683	87	468	289	*1,273,060	*1,463,818

* These returns are incomplete, the figures for two forest sawmills not being available.

Digitized by Google

How the total number of establishments in each class, and the corresponding value of plant and machinery employed, compare with similar particulars for the previous year, is shown below. It will be seen that the aggregate value of plant and machinery rose from £1,252,927 to £1,463,818, the increase being mainly traceable to establishments connected with the preparation of drink, and with the manufacture of building materials and machinery, and further to metal works, printing works, and works connected with the supply of heat, light, and energy.

Class of Industry.		No. of Establishments.		Approximate Value of Plant and Machinery.	
		1900.	1901.	1900.	1901.
				£	£
Treating raw material, the product of pastoral pursuits		6	8	4,250	5,330
Connected with food and drink, or the preparation thereof	Food	93	86	86,910	83,481
	Drink	114	118	126,762	156,857
Clothing and textile fabrics		97	106	13,251	13,109
Building materials		94	100	573,662*a*	656,775*b*
Metal works, machinery, etc. ..		55	57	149,064	221,943
Boatbuilding, repairing, etc.		2	5	1,150	3,975
Furniture, bedding, etc.		15	17	1,364	2,270
Books, paper, printing, etc.		40	44	113,320	122,514
Vehicles, saddlery, harness, etc. ..		49	49	15,591	16,993
Heat, light, and energy		36	39	139,003	151,101
Miscellaneous		31	33	28,600	29,470
Totals		632	662	1,252,927*a*	1,463,818*b*

a. Figures for one forest sawmill not supplied. *b.* Figures for two forest sawmills not supplied.

Out of the total number of 662 establishments, only 15 employed more than 100 hands. From 51 to 100 hands were employed in 20 establishments; 72 establishments employed from 21 to 50; 131 from 11 to 20; 288 from five to 10; 69 employed four hands; and 67 less than four.

The daily working hours in most of the establishments averaged slightly over eight hours. But in some of the industries, notably in the flour mills and the wine-making establishments, the hours of certain classes of employees were much longer, exceeding, in particular cases, ten hours.

The number of establishments in each industry comprised in the various classes was as follows:—

Class I.: Treating raw material, the product of pastoral pursuits.—Artificial manure works, 1; bone mills, 3; tanneries, 4.

Digitized by Google

Class II.: Connected with food and drink, or the preparation thereof.—A. Food: Bacon factory, 1; bakeries, 53; condiments, coffee, etc., 4; confectionery works, 5; flour mills, 16; ice and refrigerating works, 5; biscuit factory, 1; fish-preserving works, 1. B. Drink: Aerated water and cordial factories, 54; breweries, 32; water-condensing works, 27; wine-making establishments, 5.

Class III.: Clothing and textile fabrics.—Boot and shoe factories 19; dressmaking and millinery establishments, 28 tailoring establishments, 59.

Class IV.: Building materials.—Brickworks, 28; glazing establishments, 2; quarries and limeworks, 13; forest sawmills, 23; town sawmills and joinery works, 33; paint works, 1.

Class V.: Metal works, machinery, etc.—Agricultural Implement works, 5; electrical engineering works, 4; engineering works, iron works, foundries, plumbing and tinsmithing establishments, 44; railway and tramway workshops, 4.

Class VI.: Boatbuilding and repairing works, 5.

Class VII.: Furniture and bedding factories, 17.

Class VIII.: Books, paper, printing, etc.—Cardboard and paper box-making establishments, 2; printing and bookbinding works, 42.

Class IX.: Vehicles, saddlery, harness, etc.—Coach and wagon building and blacksmithing establishments, 34; cycle works, 5; saddlery and harness-making establishments, 10.

Class X.: Heat, light, and energy.—Electric light and power works, 10; firewood yards, 27; gasworks, 2.

Class XI.: Miscellaneous.—Assayer's establishment, 1; chaff-grinding works, 1; cooperage works, 1; cornerushing works, 2; eucalyptus oilworks, 1; guano works, 1; leather goods manufacturing establishment, 1; manufacturing chemists' establishments, 2; manufacturing jewellers' establishments, 5; monumental works, 2; optician's establishment, 1; photographic establishments, 4; picture frame-making establishment, 1; soap and candle works, 5; tent-making establishment, 1; tobacco and cigar works, 3; wireworks establishment, 1.

Particulars for the year 1901 of the working of those factories and works which employed more than 100 hands, and of others which supplied returns relating to their production, are given in the following table.

Digitized by Google

Industrial Establishments.	Establishments.		Persons Employed.		Horse Power of Engines.				Average Time in operation during the Year.	Amount of Salaries and Wages paid during the Year.	Average monthly Wages of Employees.*	Approximate Value of	
	Using Machinery worked by Steam, Gas, Oil, or Electricity.	Others.	Working Proprietors.	Employees.	Steam. Noml.	Gas. Brake.	Oil. Brake.	Electric Motor. E.H.P.				Land and Buildings.	Plant and Machinery.
	No.	No.	No.	No.	H.P.	H.P.	H.P.	H.P.	Months.	£	£	£	£
Tanneries	3	1	3	39	21	..	..	..	12·00	5,190	11·09	8,870	3,430
Bakeries	..	53	65	272	..	..	..	..	11·96	40,893	12·57	59,560	10,641
Flour Mills	16	..	9	123	266	..	..	..	9·58	13,704	11·63	56,400	27,250
Aerated Water and Cordial Factories..	49	5	47	267	178½	5	23¾	8½	11·49	33,725	10·99	40,370	51,385
Breweries	28	4	27	365	534	4	5	5	11·52	63,430	15·08	128,484	76,569
Water Condensing Works	8	19	42	163	102	..	..	..	11·36	29,747	16·06	12,505	27,153
Boot Factories	4	15	18	334	10	..	24½	..	11·91	34,032	8·56	23,350	7,705
Dressmaking and Millinery Establishments	..	28	18	314	..	..	..	..	11·04	15,662	4·52	22,571	1,279
Tailoring Establishments	..	59	60	710	..	..	..	..	11·55	80,227	9·78	104,710	4,125
Brickworks and Potteries	16	12	34	324	288½	..	3	..	9·71	37,013	11·76	28,188	33,203
Quarries and Lime Works	3	10	7	247	82	..	..	..	10·88	23,801	8·86	29,700	10,950
Town Sawmills and Joinery Works ..	26	7	24	605	362	..	64	9	11·76	81,391	11·44	66,382	41,847
Electrical Engineering Works ..	3	1	4	97	40	..	..	32½	11·76	12,411	10·88	5,770	4,600
Engineering Works, Iron Works, Foundries, Plumbing and Tinsmithing Establishments	22	22	51	1,253	475	..	103	12½	11·98	163,240	10·87	95,160	178,363
Railway and Tramway Workshops ..	3	1	..	950	112	..	..	8½	12·00	130,453	11·44	74,950	33,030
Furniture and Bedding Factories ..	6	11	20	209	4	4	4½	11	11·91	27,962	11·23	26,160	2,270
Printing and Bookbinding Works ..	34	8	42	821	22½	38½	114	130	11·93	118,776	12·13	147,045	122,129
Coach and Wagon Building and Blacksmithing Establishments ..	7	27	40	276	31	..	12½	1	10·73	35,115	11·86	40,210	14,426
Saddlery and Harness-making Establishments	1	9	9	114	..	..	..	3	11·54	14,818	11·26	17,300	1,430
Electric Light and Power Works ..	10	..	..	110	2,617	..	17	15½	11·53	18,735	14·77	14,281	124,794
Firewood Yards	27	..	37	85	93	..	49	30	10·80	9,098	9·91	14,605	6,607
Gasworks	2	..	..	54	71	5½	..	..	12·00	9,732	15·02	17,774	19,700
Soap and Candle Works	5	..	3	64	82	..	..	..	11·82	6,677	8·83	6,840	8,260
Tobacco and Cigar Works	1	2	5	88	12	..	..	..	12·00	7,517	7·11	9,845	4,065

* Rates of Wages are given in detail in chapter "Wages and Prices."

Digitized by Google

In several cases, as may be seen from the above figures, the lower average wages were paid in those industries which employed a large proportion of female hands. It is obvious, however, that these averages cannot be taken as an entirely reliable guide to determine the actual wages paid in the various industries, as they depend on other conditions besides the prevailing rates of remuneration. In some trades, for instance, the proportion of apprentices employed is greater than in others, and this will naturally lower the average.

PART V.—FINANCE.

I.—PUBLIC FINANCE.

The various financial transactions of the Government may be classified under four heads, according as they are connected with :—

I. The Consolidated Revenue Fund.
II. The General Loan Fund.
III. The Sinking Fund, or
IV. The Trust Funds.

The Balances of these Funds on the 30th June, 1902, and the manner in which these Balances were held, may be seen from the following statement :—

DR.	£
To Consolidated Revenue Fund ..	123,185
General Loan Fund	1,029,395
Sinking Funds	486,737
Trust Funds	2,489,652
Drafts *in transitu*	3,822
	£4,132,791

CR.	£
By Advances	138,179
Investments	2,126,459
Stores on hand	605,198
Cash	1,262,955
	£4,132,791

Digitized by Google

I. CONSOLIDATED REVENUE FUND.

In "The Audit Act, 1881," it was provided that "the Treasurer shall, within one month after the 31st December in each year, prepare a full and particular statement in detail of the receipt and expenditure of the several branches of public Revenue for such year, which statement shall include such amounts only as shall have been actually received and paid by the Treasurer within the year or within seven days thereafter."

This provision was somewhat modified by "The Audit Act, 1891," which repealed "The Audit Act, 1881," and provided in Section 38, that "the Colonial Treasurer shall, not later than three months after the end of every financial year, prepare a full and particular statement in detail of the Expenditure of the Revenue for such year . . . and also of the receipt of the said Revenue for the same year."

It will be noticed that the term within which the financial statement must be made was, by this Act, extended from one month to three, and that the expression "financial year" is introduced, thereby implying the intention of the Legislature to allow the Colonial Treasurer to close his accounts at some date other than the 31st December. This latter was taken advantage of in 1892, when the Colonial Treasurer, on the 21st December in that year, asked Parliament to consider the Estimates of Revenue and Expenditure for the six months ending 30th June, 1893. Since then the financial year has closed on the 30th of June in each year. The date on which the financial year closes in each of the six States of the Commonwealth and the Colony of New Zealand is as follows:—Western Australia, Victoria, New South Wales, Queensland, and South Australia, 30th June; Tasmania, 31st December; New Zealand, 31st March. The financial year of the Commonwealth Government also closes on 30th June.

The provision made in "The Audit Act, 1881," that the Annual Financial Statement should include such amounts only as had been received or paid by the Treasurer within the year, or within seven days thereafter, was slightly altered by "The Audit Act, 1891," in Section 21 of which it is provided that "all moneys voted in any year in respect of such annual estimates shall be charged with the accounts that come in course of payment during the year, or be presented for payment by the proper officer at the Treasury within ten days from the close of the financial year, and the payment of all such accounts shall be deemed to have been made within the financial year."

Commonwealth Revenue and Expenditure.

As the inauguration of the Commonwealth of Australia has, to a considerable extent, affected the Consolidated Revenue Fund by

Digitized by Google

removing the collection and disbursement of a large proportion of the Revenue from the State to the Federal Government, it will be well at this stage to briefly consider the provisions regulating the financial transactions between the States and the Commonwealth.

Under "The Commonwealth of Australia Constitution Act, 1900," the control of the Customs and Excise Department automatically passed from the State to the Federal Government on the date of the inauguration of the Commonwealth, viz., 1st January, 1901, while under a Proclamation made in accordance with the Act, the Departments of Posts, Telegraphs, and Telephones, and of Defence, were similarly transferred on 1st March, 1901.

The Act provides that until the expiration of five years from the date of the imposition of uniform duties of Customs, each State shall be credited with the revenues collected therein by the Commonwealth, and shall be debited with the expenditure incurred for the upkeep of its transferred departments, and with its proportion of the expenditure of the Commonwealth other than that connected with the transferred departments, such proportion being computed on a population basis. The balance in favour of each State is required to be paid over by the Commonwealth, month by month.

In the case of articles imported from beyond the Commonwealth passing for consumption into a State other than that into which they were originally imported, the duty is credited to the consuming State, and similarly the excise paid on goods produced or manufactured in one State and passing into another for consumption is credited to the consuming State.

The Act also provides that on the imposition by the Commonwealth of uniform duties of Customs, trade and commerce shall be absolutely free among the States of the Commonwealth with the exception of Western Australia, which, for a period of five years, following the imposition of uniform duties, is permitted to impose duties on interstate imports, such duties diminishing in each of the five years by one-fifth of the amount chargeable in the first of those years.

Uniform duties of Customs were imposed by the Commonwealth on the 9th October, 1901, so that the provisions made in the Act for the "book-keeping" method described above, of regulating the financial transactions between the State and the Commonwealth, will expire on the 9th October, 1906, as will also the Western Australian sliding scale of Customs duties on interstate imports.

The following table furnishes a statement of the Revenue and Expenditure of the Commonwealth in respect of Western Australia for the half-year ended 30th June, 1901. In this table the particulars given for the Postmaster General's and the Defence Departments relate only to the four months from 1st March to 30th June, the

Digitized by Google

former date being that on which these Departments were taken over by the Commonwealth :—

Revenue for Half-year ended 30th June, 1901.	£	Expenditure for Half-year ended 30th June, 1901.	£
Customs	475,456	Department of Trade and Customs	15,338
Excise	15,915	Department of Defence*	8,610
Post Office, Telegraph, and Telephone*	67,735	Postmaster General's Department*	84,191
Proportion of New Revenue	1	Proportion of New Expenditure	6,038
		Surplus Revenue returned to State	440,860
		Surplus Revenue due to State, 30th June, 1901	4,070
	559,107		559,107

*From 1st March to 30th June.

Similar particulars for the year ended 30th June, 1902, are as follows :—

Revenue for Year ended 30th June, 1902.	£	Expenditure for Year ended 30th June, 1902.	£
Balance from 30th June, 1901	4,070	Department of Trade and Customs	31,991
Customs	1,273,125	Department of Defence ..	34,967
Excise	62,489	Postmaster General's Department	258,570
Post Office, Telegraph, and Telephone	225,752	Proportion of New Expenditure	14,061
Defence	30	Surplus Revenue returned to State	1,225,076
Proportion of New Revenue	141	Surplus Revenue due to State, on 30th June, 1902	942
	1,565,607		1,565,607

The amounts appearing in the foregoing tables under the head of "Proportion of New Expenditure," are those debited to Western Australia on a population basis, on account of the expenditure of the Commonwealth on the salaries of the Governor General, the Commonwealth Ministers, the Senators, and the Members of the House of Representatives; Parliamentary reporting and printing; Elections; Rents and Repairs; Celebrations in connection with the Royal visit and the Coronation; the Administration of New Guinea; and other miscellaneous items not coming under the head of "Expenditure in connection with transferred Departments."

The amounts credited to the State under the head of "Proportion of New Revenue," are the sums allotted on a population basis in

Digitized by Google

respect of repayments of moneys charged or to be charged as New Expenditure.

State Revenue.

The principal sources of State Revenue during the year ended 30th June, 1902, and the amount derived from each are as follows:—

Sources of Revenue.	State Revenue for Year ended 30th June, 1902.		
	Amount.	Percentage on Total Revenue.	Per Head of Mean Population.
	£	%	£ s. d.
Taxation	173,582	5·18	0 17 7
Land	145,738	4·34	0 14 9
Mining	113,644	3·39	0 11 6
Railways and Tramways	1,488,574	44·38	7 10 11
Water Supply	15,034	0·45	0 1 6
Surplus Revenue returned by Commonwealth	1,225,076	36·52	6 4 2
Other Sources	192,476	5·74	0 19 6
Total	3,354,124	100·00	16 19 11

Taxation.

Owing to the collection of the Customs and Excise duties being now entirely in the hands of the Commonwealth Government, the amount of State collected taxation has been reduced to very small proportions. The taxes which contributed to the total of £173,582 shown in the above table are four in number, viz., Companies' Tax, Stamp Duty, Probate Duty, and License Fees, the three first being what are usually termed direct taxes, and the last an indirect tax.

For the purpose, however, of ascertaining the amount of taxation per head imposed on the people of the State, it will be necessary to take into account the Commonwealth taxation, as has been done in the annexed statement:—

Particulars.	Taxation levied in Western Australia during the Year 1901-2.	
	Amount.	Per Head of Mean Population.
	£	£ s. d.
Collected by the Commonwealth—		
Customs	1,273,125	6 9 0
Excise	62,489	0 6 4
Collected by the State—		
Companies Tax	85,890	0 8 8
License Fees	29,635	0 3 0
Probate Duty	13,624	0 1 5
Stamp Duty	44,433	0 4 6
Total Taxation	1,509,196	7 12 11

Digitized by Google

The following table furnishes particulars of the total amount raised by means of taxation in each of the financial years from 1892-3 to 1901-2, and also in each case the amount per head of mean population :—

Year.	Taxation.			Amount per Head of Mean Population.		
	Customs and Excise.	Other Taxation.	Total.	Customs and Excise.	Other Taxation.	Total.
	£	£	£	£ s. d.	£ s. d.	£ s. d.
1892–3	265,182	20,640	285,822	4 10 7	0 7 1	4 17 8
1893–4	331,298	21,548	352,846	4 18 7	0 6 5	5 5 0
1894–5	513,508	34,645	548,153	6 4 8	0 8 5	6 13 1
1895–6	780,901	74,359	855,260	7 9 4	0 14 2	8 3 6
1896–7	1,087,257	101,958	1,189,215	7 14 8	0 14 6	8 9 2
1897–8	1,017,724	104,283	1,122,007	6 4 1	0 12 9	6 16 10
1898–9	867,520	65,447	932,967	5 2 8	0 7 9	5 10 5
1899–1900	933,717	121,920	1,055,637	5 8 5	0 14 2	6 2 7
1900–1901	992,216	144,103	1,136,319	5 9 2	0 15 10	6 5 0
1901–1902	1,335,614	173,582	1,509,196	6 15 4	0 17 7	7 12 11

In this table the amounts given for Customs and Excise for the year 1900-1 were collected by the State up to 31st December, 1900, and by the Commonwealth from 1st January to 30th June, 1901, while the whole of the Customs and Excise duties for 1901-2 were collected by the Commonwealth.

Prior to 1896, only three forms of taxation were in force in this State, viz.,—Customs duties, Stamp duties, and License fees. In that year Probate duties were added to the list, followed by an Excise duty on beer in 1898, and the Companies Tax in 1899. On the imposition by the Commonwealth of uniform duties of Customs and Excise, the number of commodities subject to Excise duty in this State was increased, and now includes Spirits, Beer. Tobacco, Sugar, and Starch.

It will be seen that during the early portion of the ten years under review, the Revenue from taxation increased so rapidly both in actual amount and also per head, that in the financial year 1896-7 there was collected no less a sum than £1,189,215, or £8 9s. 2d. per head of mean population. For the two following years a declining Revenue was experienced, only £932,967, or £5 10s. 5d. per head of mean population, being obtained from this source in 1898-9. In the year 1899-1900, however, an upward movement again commenced, the total for the year 1901-2 reaching £1,509,196, the largest amount of Revenue ever derived from taxation in this State in any single year. The amount per head of mean population did not, however, attain the proportions assumed in 1896-7, being £7 12s. 11d., as against £8 9s. 2d. in that year. The abnormal increase in 1901-2 was mainly due to the imposition by the Commonwealth of uniform duties of Customs and Excise under the tariff which came into force

Digitized by Google

in October, 1901, operating in conjunction with the special Western Australian tariff on inter-State importations previously referred to. Increased amounts were also received as Companies' Tax and Probate Duty, the Revenue for 1901-2 from Taxaton other than Customs and Excise being the highest on record.

Land Revenue.

The amount of Revenue collected by the Lands Department, during each of the five financial years 1897-8 to 1901-2 is given in the following table, the heads used being those adopted by the Department in the classification of its Revenue:—

Heads of Revenue.	Year ended 30th June, 1898.	Year ended 30th June, 1899.	Year ended 30th June, 1900.	Year ended 30th June, 1901.	Year ended 30th June, 1902.
Land—	£	£	£	£	£
Sales	69,798	39,464	38,574	51,564	36,785
Rent	69,015	70,379	74,912	81,675	85,946
Timber Dues	23,028	25,976	11,064	18,006	16,992
Guano	707	1,355	899	713	934
Fees	2,768	3,283	3,154	3,559	4,130
All other sources ..	3,656	2,263	923	1,143	951
Total	168,972	142,720	129,526	156,660	145,738

Mining Revenue.

The various sources from which the Revenue of the Mines Department has been derived, and the amounts obtained from each, during the five financial years, 1897-8 to 1901-2, are as follows:—

Heads of Revenue.	Year ended 30th June, 1898.	Year ended 30th June, 1899.	Year ended 30th June, 1900.	Year ended 30th June, 1901.	Year ended 30th June, 1902.
Mining—	£	£	£	£	£
Lease Rental under Mineral Lands Act	1,600	1,434	2,758	3,050	2,436
Receipts from all other sources under Mineral Lands Act	517	724	3,484	2,900	3,534
Lease Rental under Goldfields Act	41,828	32,805	42,875	37,588	37,432
Receipts from all other sources under Goldfields Act	20,693	16,798	14,235	11,671	10,218
Receipts from Public Batteries	..	3,786	19,468	19,809	43,785
Fees under Boilers Inspection Act	..	801	2,378	2,578	2,687
Survey Fees	11,346	9,212	14,085	10,656	8,264
Examination Fees	1,225	679	821	699	576
Exemption Fees	10,009	7,096	6,344	5,475	4,434
Receipts from all other sources	183	187	141	206	278
Total	87,401	73,522	106,589	94,632	113,644

Digitized by Google

Revenue for Ten Years.

In the following summary is given the amount derived from each of the principal sources of revenue for each of the ten years, 1892-3 to 1901-2, revenue collected by the Commonwealth being included for comparative purposes in the figures shown for 1900-1 and 1901-2.

Year.	Taxation.			Land.	Mining.	Public Works.			Post, Telegraph, and Telephone.	Other Sources.	Total.
	Customs and Excise.	Other Taxation.	Total.			Railways & Tramways.	Water Supply.	Total.			
	£	£	£	£	£	£	£	£	£	£	£
1892-3	265,182	20,640	285,822	91,823	6,098	109,487	1,169	110,656	39,958	40,565	575,822
1893-4	331,298	21,548	352,846	78,058	21,520	134,967	1,203	136,170	47,680	44,972	681,246
1894-5	513,508	34,645	548,153	89,841	51,050	295,733	13,454	309,187	80,756	46,954	1,125,941
1895-6	780,901	74,359	855,260	151,574	135,168	474,635	30,000	504,635	152,320	59,738	1,858,695
1896-7	1,087,257	101,958	1,189,215	185,126	212,407	939,146	21,456	960,602	208,340	87,061	2,842,751
1897-8	1,017,724	104,283	1,122,007	168,972	87,401	1,035,199	16,821	1,052,020	220,912	103,435	2,754,747
1898-9	867,520	65,447	932,967	142,720	73,522	1,020,937	11,999	1,032,936	197,171	99,495	2,478,811
1899-1900	933,717	121,920	1,055,637	129,526	106,589	1,258,945	11,739	1,270,684	208,109	104,851	2,875,396
1900-1901	992,216	144,103	1,136,319	156,660	94,632	1,347,089	16,229	1,363,318	210,126	116,979	3,078,034
1901-1902	1,335,614	173,582	1,509,196	145,738	113,644	1,488,574	15,034	1,503,608	225,752	192,647	3,690,585

Digitized by Google

State Expenditure.

The principal items of Expenditure from Consolidated Revenue during the year ended 30th June, 1902, are as follows :—

Heads of Expenditure.	State Expenditure for Year ended 30th June, 1902.		
	Amount.	Percentage on Total Expenditure.	Per Head of Mean Population
	£	%	£ s. d.
Railways and Tramways	1,269,619	40·29	6 8 8
Public Works	153,485	4·87	0 15 7
Public Buildings	120,037	3·81	0 12 2
Public Debt—			
Interest	465,318	14·77	2 7 2
Sinking Fund	136,820	4·34	0 13 10
Education	102,360	3·25	0 10 4
Police	123,724	3·93	0 12 6
Medical	90,115	2·86	0 9 2
Charities	26,227	0·83	0 2 8
Gaols	22,727	0·72	0 2 4
Lands and Surveys	58,968	1·87	0 6 0
Mines	101,958	3·23	0 10 4
Other Expenditure	480,069	15·23	2 8 8
Total	3,151,427	100·00	15 19 5

For the purpose of instituting comparisons with the Expenditure of previous years, it will be necessary to include, for 1900-1 and 1901-2, the Expenditure by the Commonwealth in respect of Western Australia, as has been done in the following table, which gives, for each of the ten years, 1892-3 to 1901-2, details for some of the principal heads of Expenditure :—

Year.	Railways and Tramways.	Other Public Works.	Public Debt—Interest and Sinking Funds.	Post, Telegraph, and Telephone.	Other Expenditure.	Total.
	£	£	£	£	£	£
1892–3	100,944	85,696	103,837	53,312	285,583	629,372
1893–4	105,978	68,163	133,262	66,983	281,971	656,357
1894–5	183,941	145,287	154,723	86,800	365,978	936,729
1895–6	266,868	638,502	194,623	170,325	553,545	1,823,863
1896–7	580,147	805,480	251,172	313,203	889,451	2,839,453
1897–8	852,648	847,240	338,263	289,475	929,286	3,256,912
1898–9	749,129	325,895	426,760	237,262	800,312	2,539,358
1899–1900	884,861	219,465	439,825	239,309	832,215	2,615,675
1900–1901	1,071,576	324,123	486,800	255,514	1,027,231	3,165,244
1901–1902	1,269,619	273,522	602,138	258,570	1,087,167	3,491,016

Revenue and Expenditure.

Including, for the purposes of comparison, in the figures for 1900-1 and 1901-2 the Revenue collected in Western Australia by

Digitized by Google

Digitized by Google

Digitized by Google

the Commonwealth Government, and the Expenditure by that Government in respect of Western Australia, the following table shows the total Revenue and Expenditure, and the corresponding amounts per head of mean population, for each of the years specified since the earliest years of Western Australian settlement :—

Year.	Revenue.		Expenditure.	
	Amount	Per Head of Mean Population.	Amount.	Per Head of Mean Population.
	£	£ s. d.	£	£ s. d.
1830	17,485	9 17 11	17,485	9 17 11
1840	16,827	7 5 7	15,098	6 10 8
1850	19,138	3 5 0	16,657	2 16 7
1860	69,863	4 12 11	61,745	4 2 2
1870	98,132	4 1 9	113,046	4 14 2
1880	180,049	6 4 10	204,337	7 1 8
1890	414,314	9 4 2	401,737	8 18 7
1892–3	575,822	9 16 9	629,372	10 15 1
1893–4	681,246	10 2 9	656,357	9 15 4
1894–5	1,125,941	13 13 4	936,729	11 7 5
1895–6	1,858,695	17 15 5	1,823,863	17 8 9
1896–7	2,842,751	20 4 5	2,839,453	20 3 11
1897–8	2,754,747	16 15 10	3,256,912	19 17 1
1898–9	2,478,811	14 13 5	2,539,358	15 0 7
1899–1900	2,875,396	16 13 10	2,615,675	15 3 8
1900–1	3,078,034	16 18 8	3,165,244	17 8 3
1901–2	3,690,585	18 14 0	3,491,016	17 13 10

For the calendar year 1902, the Revenue amounted to £3,936,926, and the Expenditure to £3,694,363, or £19 0s. 1d. and £17 16s. 8d., respectively, per head of mean population.

II. GENERAL LOAN FUND.

In 1896, an Act entitled "The Loans Consolidation Act, 1896," was passed, which made provision for merging the balances of Loans unexpended on 30th June, 1896, in a fund to be known as "The General Loan Fund." Prior to this the practice which had been in vogue since the initiation of Loan Expenditure in this State was to keep separate and distinct all the acounts and transactions connected with each of the several loans issued from time to time; but

Digitized by Google

since the establishment of this fund, the proceeds of all new loan have been passed to its credit. Particulars relative to the Fund fo the financial year 1900-1 are as follows:—

Receipts.	£	Net Expenditure.	£
Balance on 1st July, 1901	520,078	Departmental	63,583
Sales of Materials and other credits connected with expenditure of previous years ..	18,026	Railways and Tramways	568,599
Proceeds of Sale of Inscribed Stock—		Harbour and River Improvements ..	174,322
Second Instalment of Coolgardie Water Supply Loan (60 Vict., No. 12) ..	1,323,108	Water Supply and Sewerage in Towns ..	11,227
Second Instalment of Loan 1899 (63 Vict., No. 44)	296,301	Coolgardie Water Supply	699,348
First Instalment of Loan, 1901 (1 Edwd., VII., No. 2)	1,185,205	Development of Goldfields and Mineral Resources	31,805
Local Inscribed Stock	281,680	Roads and Bridges	730
		Development of Agriculture	10,678
		Immigration	3,475
		Miscellaneous, including charges and expenses of raising Loans	10,062
		Amounts advanced pending being provided for from Loan Funds ..	21,174
		Treasury Bills repaid	1,000,000
		Balance on 30th June, 1902	1,029,395
	£3,624,398		£3,624,398

Under the head of "Railways and Tramways," the largest item of Expenditure for the year was that of "Rolling Stock," the amount

Digitized by Google

spent thereon being £215,577. The outlay on "Rails and Fastenings" was £113,764, while a sum of £101,266 was spent in connection with the construction of the line from Menzies to Leonora. "Additions and Improvements to opened lines" absorbed £66,519, and the "Railway Workshops" £27,720.

The principal works concerned in the expenditure of £174,322 on "Harbour and River Improvements" were the Fremantle Harbour Works, £135-260, and the Albany Harbour Works, £17,984, while an outlay of £10,210 was also incurred in connection with lighthouses.

Of the £31,805 devoted to "the Development of Goldfields and Mineral Resources," the erection of Public Batteries absorbed £15,841, the balance being distributed over the various Goldfields and other Mineral Districts of the State for the assistance of developmental work.

In the following table is shown the total Expenditure from Loans to 30th June, 1902, on each of the Classes of Public Works, etc., specified therein. This statement is, unfortunately, hardly as complete as might be desired, owing to the fact that a portion of the sum which appears under the indefinite head of "Development of Goldfields and Mineral Resources," in accordance with the Schedules of the Loan Acts, has been spent on some of the works separately specified. The item most affected by this classification is, probably, that of "Water Supply and Sewerage." In this table the item "Departmental," which appeared in the statement of the General Loan Fund, has been apportioned to the various specified heads according to the Departmental Expenditure incurred in connection with each:—

Public Works and Services.	Loan Expenditure to 30th June, 1902.
	£
Railways and Tramways	7,547,950
Electric Telegraphs	269,308
Harbours, Rivers, Lighthouses, etc.	1,835,211
Roads and Bridges	142,538
Public Buildings	63,876
Water Supply and Sewerage	2,329,364
Development of Goldfields and Mineral Resources ..	784,815
Agricultural Surveys and Development	367,844
Immigration	27,697
Miscellaneous	63,352
Total	£13,431,955

The total here shown is the actual cash expenditure in connection with the Public Works and Services carried out by means of Loans. As, however, most of these loans were raised at a discount, and an

Digitized by Google

in addition, the expenses of flotation were, in many cases, very heavy, the amount of indebtedness represented by this expenditure is considerably greater than the expenditure itself. Other factors to be taken into consideration in this connection are the balance of Loan funds still available for expenditure, the net results of Loan conversions, and the amount redeemed.

The following statement shows the effects of these various operations, and gives the total public debt on 30th June, 1902 :—

Particulars.		Amount.
		£
Total Expenditure on Works and Services		13,431,955
Expenses raising Loans (less premiums on Loans, 1893 and 1894)		154,794
Discounts on Loan raisings		443,062
Premiums on Debentures converted into Inscribed Stock		5,450
Conversion Expenses		3,201
Amounts advanced, pending being provided for from Loan Funds		21,174
Unexpended Balance, General Loan Fund		1,029,395
		15,089,031
Less Discounts on Debentures converted into Inscribed Stock ..	£3,721	
Debentures redeemed	143,000	
		146,721
* Public Debt on 30th June, 1902		£14,942,310

*On 31st December, 1902, the Public Debt amounted to £15,068,955.

It may be pointed out that had there been no redemption of Loans, the total indebtedness of the State on 30th June, 1902, would have been £15,085,310, while the amount of cash available for expenditure which that indebtedness represents is £14,482,524, or about 96 per cent. ; the balance of 4 per cent being absorbed in discount, expenses, etc.

Public Debt.

The earliest records of Loan transactions of the Government of Western Australia are those contained in an Ordinance passed on the 7th August, 1845, "to authorise the Governor of Western Australia to raise the sum of £2,000 on Loan for the erection of a Gaol or for other public services of the Colony." On the 6th May, 1854, a further Ordinance was passed "to empower the Governor to raise £800 for the purchase of certain building allotments in the town of Perth." This was succeeded by an Ordinance passed on the 17th September, 1858, "to enable the Governor to borrow £7,000, and to apply the same towards the erection of a new Government House."

These Loans appear to have been all of a purely temporary nature, and to have been repaid prior to the inauguration of the Public Works

Digitized by Google

Loan Policy, as at present understood, which may be said to date from the passing on the 15th August, 1872, of "An Act for the raising of £35,000 by Loan for the construction of certain public Works."

The Public Debt of Western Australia may, therefore, be considered as dating from the raising of this Loan, which was effected in 1873 by the issue of debentures bearing interest at 6 per cent., and having a currency of 28 years, at the expiration of which time they were to be repayable at par. Further sums have been raised from time to time under Acts passed in 1873, 1875, 1878, 1881, 1882, 1884, 1888, 1893, 1896, 1897, 1899, 1900, and 1901.

In connection with each of the Loan issues of this State, provision has been made for a Sinking Fund, the investment of which has been placed in the hands of Trustees in London.

Particulars. for each of the financial years, 1892-3 to 1901-2, relative to the total amount of debt outstanding, the accrued sinking fund, and the net indebtedness, together with the amounts per head of mean population, are as follows:—

Date.	Public Debt.		Accrued Sinking Fund.	Net Indebtedness.	
	Amount.	Per Head of Population.		Amount.	Per Head of Population.
	£	£ s. d.	£	£	£ s. d.
30th June, 1893 ..	2,280,013	37 5 3	114,294	2,165,719	35 7 10
„ 1894 ..	3,417,339	45 0 9	138,531	3,278,808	43 4 2
„ 1895 ..	3,992,681	44 12 5	154,785	3,837,896	42 17 10
„ 1896 ..	4,736,573	38 14 6	175,033	4,561,540	37 5 11
„ 1897 ..	7,310,815	46 7 7	205,637	7,105,178	45 1 6
„ 1898 ..	9,118,224	53 8 4	255,784	8,862,440	51 18 4
„ 1899 ..	10,372,825	61 13 11	310,373	10,062,452	59 17 0
„ 1900 ..	11,674,640	65 13 4	377,161	11,297,479	63 10 11
„ 1901 ..	12,709,430	67 3 4	431,478	12,277,952	64 17 8
„ 1902 ..	14,942,310	71 14 6	486,737	14,455,573	69 7 10

It will be seen that during the nine years that elapsed between the 30th June, 1893, and the 30th June, 1902, the Net Indebtedness of Western Australia increased by no less a sum than £12,289,854, or an average of £1,365,539 per annum. The year that was responsible for the largest addition was that ended 30th June, 1897, during which the net indebtedness increased by £2,543,638, while the smallest increment during the period under review was that of £559,088, for the year ended 30th June, 1895.

Digitized by Google

The conditions under which the loans have been issued have varied considerably from time to time, two important variations being the substitution of inscribed stock for debentures, and the gradual reduction of the rate of interest involved. As before mentioned, the Loan authorised by the 1872 Loan Act, and raised in 1873, was at 6 per cent. This was, however, the only Loan obtained at so high a rate of interest, the next issues being made at 5 per cent. during the years 1874 to 1877. In 1879 the first 4½ per cent. Loan was raised, while money at 4 per cent. was first obtained in 1881, at 3½ per cent. in 1895, and at 3 per cent. in 1896.

The following table furnishes particulars relative to the amount of Debentures and Inscribed Stock at each rate of interest, in circulation on 30th June, 1902 :—

Rate of Interest.	Public Debt on 30th June, 1902.		
	Debentures.	Inscribed Stock.	Total.
%	£	£	£
5	49,100	..	49,100
4½	73,600	..	73,600
4	153,300	2,851,930	3,005,230
3½	..	4,464,380	4,464,380
3	..	7,350,000	7,350,000
Total ..	276,000	14,666,310	14,942,310

The effect of the reductions in the rate of interest payable in respect of Loans, may be most readily seen by comparing the amounts at the several rates on 30th June, 1902, with those for the corresponding years in the two previous decades :—

Rate of Interest.	Public Debt on 31st December, 1882.	Public Debt on 31st December, 1892.	Public Debt on 30th June, 1902.
%	£	£	£
6	35,000	33,000	..
5	126,000	87,400	49,100
4½	200,000	114,900	73,600
4	150,000	2,026,564	3,005,230
3½	..	..	4,464,380
3	..	..	7,350,000
Total ..	511,000	2,261,864	14,942,310
Average rate payable	4·58 %	4·09 %	3·36 %

It may be mentioned that the average rate of interest payable on the nominal amount of Western Australian Public Debt, viz., 3·36 per cent., is less than the corresponding rate in the case of any other of the Australasian States or the colony of New Zealand.

Digitized by Google

The due dates of the Public Debt outstanding on 30th June, 1902, are as follows :—

Year when due.	Public Debt on 30th June, 1902.		
	Debentures.	Inscribed Stock.	Total.
	£	£	£
1903	31,500	..	31,500
1905	17,600	..	17,600
1910	..	1,334,380	1,334,380
1927	..	2,500,000	2,500,000
1931	..	1,876,000	1,876,000
1934	..	975,930	975,930
1935	..	6,880,000	6,880,000
1936	..	1,100,000	1,100,000
Annual Drawings ..	226,900	..	226,900
Total	276,000	14,666,310	14,942,310

In the case of several of the loans issued in recent years, the Government has reserved the option of redeeming at par on giving twelve calendar months' notice at any time within a certain specified period prior to the date of maturity.

Thus, of the £1,334,380 due in 1910, the Government has the option of redeeming, under the above conditions, £460,280 at any time within four years prior to the date of maturity. Similarly the whole of the amounts due in 1931 and 1936, as well as £4,500,000 of that due in 1935, may be redeemed at any time within 20 years prior to these dates, while the balance of £2,380,000 due in 1935 is similarly redeemable at any time within 15 years prior to the date of maturity.

In addition to the Debentures and Inscribed Stock which at present make up the total of the Public Debt of the State, another form of Government security, viz., the Treasury Bill, has, on various occasions during recent years, occupied a position in the Debt statement. Under 57 Vict., No. 2, as amended by 61 Vict., No. 1, the Colonial Treasurer is empowered to issue Treasury Bills to any amount, not exceeding £3,000,000, authorised to be raised by any Loan Act, the Bills to be issued for sums of £10 or any multiple thereof, and

Digitized by Google

the rate of interest not to exceed 5 per cent. These Bills were first issued in 1893, and were intended to be a temporary means of raising loan moneys in cases when, owing to the state of the money market, or for other reasons, it was deemed injudicious at the time to contract a permanent loan. They differ materially from English Treasury Bills, and correspond rather to the Exchequer Bonds which were in force in England until 1897. They are, in fact, short term debentures, and have usually been issued for periods varying from one to three years. At the present time there are none outstanding, the balance of the last issue having been redeemed during the financial year ended 30th June, 1902.

Of the total of £14,666,310 of Inscribed Stock in circulation on 30th June, 1902, £1,334,380 was inscribed locally at the State Treasury under the provisions of "The Local Inscribed Stock Act, 1897" (61 Vict., No. 8), and subsequent amending Acts. Under these Acts it is provided that the Governor may from time to time authorise the issue of "Local Inscribed Stock" at the Treasury at Perth, for any sum not exceeding, in the whole, the sum which, at the time of issue, is authorised by any Act of Parliament to be borrowed. The Stock is required to be issued for £5 or any multiple thereof, the date of redemption to be not later than 50 years from that of issue, and the rate of interest not to exceed 4 per cent. per annum.

The figures which, in the foregoing pages, have been given as the Public Debt of this State on 30th June, 1902, are exclusive of Mortgage Bonds to the amount of £113,540, issued under the Agricultural Bank Act, to raise funds for promoting the occupation, cultivation, and improvement of agricultural lands, and also of Debentures amounting to £60,438 issued under the Agricultural Lands Purchase Act in connection with the purchase of estates for subdivision and re-sale. As the interest and sinking funds connected with these bonds and debentures are not charged against the Consolidated Revenue Fund, but are paid out of special Trust Funds created under the respective Acts, it has been considered by the Treasury that these loans should not be treated as constituting portion of the Public Debt, and consequently they have, throughout this chapter, been excluded from the total.

During the year ended 30th June, 1902, two Western Australian Loans of £1,500,000 each were placed on the London market—one on the 18th September, 1901, and the other on the 30th January, 1902. The former, which was issued at 3 per cent., was the second instalment of the loan authorised by the Coolgardie Goldfields Water Supply Loan Act, 1896, while the latter, which was a 3½ per cent. loan, comprised a second instalment of £300,000 under "The Loan Act, 1899," and a first instalment of £1,200,000 under that of 1901.

Digitized by Google

Detailed particulars relative to the flotation of these loans are as follows:—

Particulars.	Coolgardie Goldfields Water Supply Loan Act, 1896 (60 Vict., No. 12).	Loan Act, 1899 (63 Vict., No. 44).	Loan Act, 1901 (Edwd. VII., No. 2).
	Second Instalment.	Second Instalment.	First Instalment.
Nominal Amount	£1,500,000	£300,000	£1,200,000
Nominal Rate of Interest	3 per cent.	3½ per cent.	3½ per cent.
Interest payable half-yearly	15th Jan., and 15th July	1st May and 1st Nov.	1st May and 1st Nov.
Principal re-payable at par	15th January, 1927	1st May, 1935	1st May, 1935
Date on and after which the Government has the option of redeeming the Stock at par on giving 12 calendar months' notice	No option	1st May, 1920	1st May, 1920
When Floated	18th September, 1901	30th January, 1902	30th January, 1902
Minimum Price fixed	£91 per cent.	£102 10s. 0d.	£102 10s. 0d.
Payment in full	25th November, 1901	14th April, 1902	14th April, 1902
Gross Proceeds	£1,365,000	£307,500	£1,230,000
Gross Proceeds per £100 (nominal)	£91	£102 10s. 0d.	£102 10s. 0d.
Flotation Expenses (including net discount on prepayment of Instalments)	£36,999 16s. 0d.	£7,257 14s. 0d.	£29,030 16s. 2d.
Flotation Expenses per £100 (nominal)	£2 9s. 4d.	£2 8s. 5d.	£2 8s. 5d.
Net proceeds available for Expenditure	£1,328,000 4s. 0d.	£300,242 6s. 0d.	£1,200,969 3s. 10d.
Accrued Interest	£14,872 4s. 0d.	£3,941 1s. 11d.	£15,764 7s. 8d.
Net Proceeds, less Accrued Interest	£1,313,128	£296,301 4s. 1d.	£1,185,204 16s. 2d.
Net Proceeds, less Accrued Interest, per £100 (nominal)	£87 10s. 10d.	£98 15s. 4d.	£98 15s. 4d.
Rate of Interest per £100 sterling paid by the Government:—			
(a.) If no allowance be made for redemption at par	£3 8s. 6d.	£3 10s. 10d.	£3 10s. 10d
(b.) If allowance be made for redemption at par at earliest date of maturity	*£3 15s. 3d.	£3 11s. 10d.	£3 11s. 10d.
(c.) If allowance be made for redemption at par at latest date of maturity	..	£3 11s. 3d.	£3 11s. 3d.
Rate of Interest per £100 sterling yielded to Original Investors:—			
(a.) If no allowance be made for redemption at par	£3 6s. 8d.	£3 9s. 2d.	£3 9s. 2d.
(b.) If the stock be held till repayment at earliest date of maturity	*£3 12s. 1d.	£3 8s. 3d.	£3 8s. 3d.
(c.) If the stock be held till repayment at latest date of maturity	..	£3 8s. 10d.	£3 8s. 10d.

*One date only.

It will be seen from the above table that the nominal rate of interest payable furnishes but poor indication of the cost to the

Digitized by Google

Government of any particular loan, since the amount of discount or premium at which the loan was floated, the expense incurred, the amount of accrued interest, the term of the loan, and the fact of repayment at par at the end of the term must all be taken into consideration. The true rates of interest involved, according to the various standpoints from which the question may be viewed, are shown in the lower portion of this table, the rate most suitable for comparative purposes in this connection being probably that which gives the "Interest per £100 sterling paid by the Government, if "allowance be made for redemption at par at latest date of maturity."

The following table, which gives particulars relating to Loans floated on the London market from 1894 onwards, furnishes a comparative statement of such rates:—

Date of Issue.	Term of Loan.	Nominal Amount Raised.	Nominal Rate of Interest payable.	True Rate of Interest per £100 sterling paid by the Government if allowance be made for redemption at par at latest date of maturity.
	Years.	£	%	£ s. d.
12th June, 1894	37	540,000	4	3 19 1
2nd May, 1895	40	750,000	3½	3 8 8
4th May, 1896	39	750,000	3	3 0 8
14th May, 1897	38	1,000,000	3	3 6 1
14th January, 1898	29	1,000,000	3	3 5 8
26th July and 30th September, 1898	37	1,000,000	3	3 7 8
22nd March, 1900	35½	1,000,000	3	3 10 3
27th November, 1900	34½	500,000	3½	3 13 8
27th November, 1900	34½	380,000	3½	3 13 8
18th September, 1901	25½	1,500,000	3	3 15 3
30th January, 1902	33½	300,000	3½	3 11 3
30th January, 1902	33½	1,200,000	3½	3 11 3

III. SINKING FUNDS.

As before stated, provision is made for a Sinking Fund in the case of each of the Western Australian Loans issued, the annual instalments varying in different instances, from 1 to 3 per cent. of the nominal amount of the loan. These instalments are a charge upon the Consolidated Revenue Fund of the State, and are placed in the hands of Trustees in London, to be invested and from time to time applied to the redemption of loans falling due. Up to 30th June, 1902, Debentures to the amount of £143,000 had been redeemed by means of this fund, while the investments of the fund at that date, together with the sum in the hands of the trustees or placed at interest by them with the London and Westminster Bank, totalled £486,737. The securities in which the fund is invested consist entirely of those of the British, Indian, and Colonial Governments. Particulars relative

Digitized by Google

to the position of the Sinking Funds at the end of each of the financial years, 1892-3 to 1901-2, are as follows :—

Date.	Sinking Funds.		
	Amount.	Average Rate of Interest at which invested.	Percentage on Total Public Debt.
	£	%	%
30th June, 1893 ..	114,294	3·61	5·01
Do. 1894	138,531	3·56	4·05
Do. 1895	154,785	3·57	3·88
Do. 1896	175,033	3·62	3·70
Do. 1897	205,637	3·58	2·81
Do. 1898	255,784	3·49	2·81
Do. 1899	310,373	3·42	2·99
Do. 1900	377,161	3·33	3·23
Do. 1901	431,478	3·36	3·39
Do. 1902	486,737	3·32	3·26

IV. TRUST FUNDS.

Under this head may be included all the various Trust and Deposit Accounts controlled by the Government. These funds, which on 30th June, 1893, amounted to £313,016, have in recent years increased so largely that on 30th June, 1902, the total reached was £2,489,652.

The following are the principal items contributing to this total :—

Account.	Amount.
	£
Post Office Savings Bank	1,891,648
Bondholders—Interest due	122,884
Life Assurance Companies' Deposits	122,787
Sinking Funds—Municipal Loans	53,693
Roads Boards' Current Accounts	49,177
Contractors' Deposits	22,833
Accident and Guarantee Insurance Companies' Deposits	20,000
Fire and Marine Insurance Companies' Deposits ..	20,000
Curator Intestates' Estates	18,096
Agricultural Land Purchase Act Trust Fund	11,024
Agricultural Bank Advances Redemption Account ..	7,276
Other Accounts	150,243
Total, Trust Funds	2,489,652

Of the total amount of Trust Funds on 30th June, 1902, more than 75 per cent. belonged to the Post Office Savings Bank Accounts. From the attached table, which furnishes particulars of the Trust Funds at the end of each of the ten financial years, 1892-3 to 1901-2, it will be seen that although this preponderance of Savings Bank Accounts was not in evidence at the four earliest dates there given,

Digitized by Google

yet, in every case, a very considerable proportion of the Trust Funds was due to them :—

Date.	Post Office Savings Bank Accounts.	Other Trust Funds.	Total Trust Funds.
	£	£	£
30th June, 1893	75,603	237,413	313,016
Do. 1894	143,058	377,313	520,371
Do. 1895	222,285	361,392	583,677
Do. 1896	457,972	653,655	1,111,627
Do. 1897	858,575	592,965	1,451,540
Do. 1898	1,072,591	906,140	1,978,731
Do. 1899	1,116,276	574,407	1,690,683
Do. 1900	1,307,999	494,143	1,802,142
Do. 1901	1,620,826	536,194	2,157,020
Do. 1902	1,891,648	598,004	2,489,652

2.—PRIVATE FINANCE.

(a.) Banks of Issue.

The Commonwealth of Australia Constitution Act empowers the Federal Legislature to make laws with respect to banking, but up to the present time no steps have been taken by the Federal Government to introduce legislation dealing with the subject. The banking returns of the several States of the Commonwealth are, consequently, furnished in accordance with the different local enactments, which, as regards these requirements, do not differ materially from each other.

Digitized by Google

The earliest banking legislation of this State is embodied in an Act passed in 1837 (8 Gul. IV., No. 1), at which time it would appear that orthodox banking institutions were unknown in Western Australia.

This Act provided, amongst other things, that all banks "issuing promissory notes payable to bearer on demand" should keep weekly accounts of the amount of notes in circulation and of deposits, and should furnish quarterly to the Colonial Secretary a return showing the averages of such weekly accounts. Subsequently, in an Ordinance passed in 1866 to incorporate the National Bank of Australasia (30 Vict., No. 9), and, again in an Act passed in 1879 to incorporate the Western Australian Bank (42 Vict., No. 33), the forms of the returns required from these two banks were included as schedules to the respective enactments. These returns were also required to be furnished quarterly to the Colonial Secretary, and were to comprise the averages of the Statements prepared weekly, showing under certain specified heads the assets and liabilities of the banks. In addition to these particulars, a statement of the capital of each bank was required, together with the rate and amount of the dividend last paid, and the amount of reserved profits. The forms laid down in these enactments are those at present in use.

Under the provisions of "The Stamp Act, 1882," every bank issuing notes "without affixing thereto the stamp by this Act required to be affixed to promissory notes," is, under a penalty of £500, compelled to furnish quarterly the returns above referred to.

The following are the banks of issue at present operating in this State:—

Bank.	Locality of Head Office.	Act of Incorporation.	Date when Business commenced in Western Australia.
Western Australian Bank ..	Perth ..	Special Act ..	1841
National Bank of Australasia, Limited	Melbourne	Victorian Companies Act, 1890	1866
Union Bank of Australia, Limited	London ..	English Companies Acts, 1862-79	1878
Bank of New South Wales ..	Sydney ..	Special Act ..	1883
Commercial Bank of Australia, Limited	Melbourne	Victorian Companies Act, 1890	10th January, 1888
Bank of Australasia	London ..	Royal Charter ..	2nd May, 1894

It will be seen that of these six banks two have their head offices in London, two in Melbourne, one in Perth, and one in Sydney.

The first in the field was the Western Australian Bank, which commenced business in this State in 1841. It is a purely local bank,

Digitized by Google

having no branches elsewhere than in Western Australia. It was incorporated under a Special Act of the Western Australian Legislature, which was passed in 1878, but subsequently repealed and re-enacted with amendments in 1896. The authorised capital with which the bank was established was £20,000, but this has since been increased to £250,000, in 25,000 shares of £10 each, of which £100,000 is paid up. The reserve fund amounts to £250,000, reserved profits to £8,565 5s. 10d., and the reserve liability of shareholders to £100,000. In addition to the head office in Perth, branches and agencies are now established in Albany, Beverley, Boulder, Bridgetown, Broad Arrow, Bulong, Bunbury, Busselton, Coolgardie, Cue, Day Dawn, Dongara, Esperance, Fremantle, Geraldton, Greenbushes, Guildford, Kalgoorlie, Kanowna, Katanning, Kookynie, Laverton, Lennonville, Leonora, Menzies, Midland Junction, Mount Magnet, Mount Malcolm, Mount Morgans, Nannine, Narrogin, Newcastle, Norseman, Northam, Pingelly, Ravensthorpe, Southern Cross, Yundamindera, and York. The London agents for the bank are the Bank of Adelaide, 11 Leadenhall Street, E.C.

In 1866, twenty-five years after the inauguration of the Western Australian Bank, the National Bank of Australasia, Melbourne, established a branch of its business in this State, a special Act of incorporation being passed by the Western Australian legislature in 1866, and amended in 1867. The head office of the bank is in Melbourne, and branches exist in Victoria, South Australia, New South Wales, and Western Australia, while the London Office is at 123 Bishopsgate Street Within, E.C. The authorised capital is £3,407,904, of which £1,498,220 is paid up. The Reserve Fund amounts to £75,000, and the Reserve Liability of shareholders to £715,464. As a result of the financial crisis of 1893, this bank was reconstructed under the title of "The National Bank of Australasia, Limited." The Western Australian branches and agencies now in existence are situated at Albany, Coolgardie, Fremantle, Geraldton, Kalgoorlie, Katanning, Leonora, Mount Morgans, Narrogin, Northam, Perth, and Wagin.

In 1878, twelve years after the advent of the National Bank of Australasia, a branch of the Union Bank of Australia, Limited, commenced business here. This bank was established in 1837, and has its head office at 71, Cornhill, London, E.C., while branches have been opened in all the States of Australia and the Colony of New Zealand. The paid up capital is £1,500,000, the Reserve Funds £950,000, and the Reserve Liability of Proprietors £3,000,000. Branches have been established in the following Western Australian towns:—Albany, Broome, Bunbury, Burtville, Carnarvon, Coolgardie, Cue, Fremantle, Geraldton, Kalgoorlie, Kanowna, Kookynie, Lawlers, Marble Bar, Mulline, Narrogin, Northam, Perth, Port Hedland, Roebourne, Sir Samuel, Wiluna, and York.

Digitized by Google

The fourth to start operations in this State was the Bank of New South Wales, which opened a branch in Perth in 1883. This bank, which appears to be the oldest of the banks of issue trading in Australasia, was established in 1817, and has at present a paid-up capital of £2,000,000, and a reserve fund of £1,315,000, while the reserve liability of proprietors amounts to £2,000,000. The head office is in Sydney, and branches have been opened in all the States of the Commonwealth except Tasmania, as well as in the Colonies of New Zealand and Fiji. The London branch is situated in Old Broad Street. Six branches have been established in this State, viz., at Boulder, Coolgardie, Fremantle, Kalgoorlie, Lawlers, and Perth.

In 1888 the Commercial Bank of Australia commenced business in this State by opening a branch in Perth. The head office of this bank is in Melbourne, and branches exist in all the States of the Commonwealth except Tasmania. The London office is at 1 Bishopsgate Street Within, corner of Leadenhall Street, E.C. During the financial crisis of 1893 it was found necessary to effect a reconstruction, the name taken by the reconstructed institution being "The Commercial Bank of Australia, Limited." The registered capital amounts at present to £3,150,000, the paid-up capital to £2,212,172, and the "Special Assets Trust Reserve" to £155,000. There are seven branches of the bank in this State, situated at Boulder, Collie, Coolgardie, Fremantle, Kalgoorlie, Perth, and Southern Cross, respectively.

Of the six banks of issue at present operating in this State, the last to commence business here was the Bank of Australasia, which opened a branch in Perth in 1894. The head office is at 4 Threadneedle Street, London, E.C., and branches have been established in all the States of Australia and the Colony of New Zealand. This bank was incorporated by Royal Charter in 1835, and has at the present time a paid-up capital of £1,600,000, a reserve fund of £1,070,000, and a reserve liability of proprietors under the Charter of £1,600,000. Branches have been established in this State at Broad Arrow, Bunbury, Coolgardie, Cue, Davyhurst, Fremantle, Kalgoorlie, Laverton, Lennonville, Menzies, Peak Hill, and Perth.

Digitized by Google

Liabilities and Assets.

The averages for the year 1902 of the weekly statements of the Liabilities in this State of each of the Banks, prepared in accordance with the forms previously referred to, are as follows:—

Bank.	Average Liabilities in Western Australia, 1902.						
	Notes in Circulation.	Bills in Circulation.	Balances due to other Banks.	Deposits.			Total Average Liabilities.
				Not bearing Interest.	Bearing Interest.	Total.	
	£	£	£	£	£	£	£
Western Australian Bank	138,371	20,107	59,340	1,055,118	810,934	1,866,052	2,083,870
National Bank of Australasia, Ltd. ..	54,956	3,675	10,821	294,716	161,551	456,267	525,719
Union Bank of Australia, Ltd. ..	107,431	5,753	..	897,569	308,348	1,205,917	1,319,101
Bank of New South Wales	22,801	1,317	2,570	381,268	153,062	534,330	561,018
Commercial Bank of Australia, Ltd.	12,148	697	..	144,873	22,054	166,927	179,772
Bank of Australasia	58,304	6,571	..	429,151	137,070	566,221	631,096
All Banks	394,011	38,120	72,731	3,202,695	1,593,019	4,795,714	5,300,576

Digitized by Google

The next table furnishes corresponding particulars relative to Assets for the year 1902:—

Bank.	Average Assets in Western Australia, 1902.							
	Coined Gold, Silver, and other metals.	Gold and Silver, in Bullion and Bars.	Government Securities.	Landed Property and Bank Premises.	Notes and Bills of other Banks.	Balances due from other Banks.	Notes and Bills discounted, and other Debts to Banks not before enumerated.	Total Average Assets.
	£	£	£	£	£	£	£	£
Western Australian Bank	973,662	152,439	61,988	58,576	29,940	69,552	1,177,611	2,523,768
National Bank of Australasia, Limited	175,706	48,256	15,000	35,853	6,202	221	590,521	871,759
Union Bank of Australia, Limited ..	305,395	149,821	..	27,017	6,502	495	695,787	1,245,017
Bank of New South Wales	471,896	57,724	23,462	25,583	1,732	3,063	322,292	905,752
Commercial Bank of Australia, Limited	104,961	4,399	..	33,916	5,047	1	222,872	371,196
Bank of Australasia	174,147	94,132	..	30,645	8,122	..	215,023	522,069
All Banks	2,265,767	506,771	100,450	211,590	57,545	73,332	3,224,106	6,439,561

Digitized by Google

In the following table are given particulars for each of the ten years, 1893 to 1902, of the average liabilities of all the Banks of issue operating in this State. The figures shown are, in each case, the yearly averages of the statements prepared weekly by the banks, in accordance with the Stamp Act, 1882:—

Year.	No. of Banks.	Average Liabilities in Western Australia.						
		Notes in Circulation.	Bills in Circulation.	Balances due to other Banks.	Deposits.			Total Average Liabilities.
					Not bearing Interest.	Bearing Interest.	Total.	
		£	£	£	£	£	£	£
1893	5	84,698	22,594	19,867	462,752	830,695	1,293,447	1,420,606
1894	6	143,156	25,458	8,020	751,430	877,872	1,629,302	1,805,936
1895	6	214,679	57,465	15,185	1,593,372	996,355	2,589,727	2,877,056
1896	6	395,092	85,382	25,403	3,192,348	1,385,048	4,577,396	5,083,273
1897	6	374,993	75,396	68,774	3,096,105	973,562	4,069,667	4,588,830
1898	6	330,673	60,040	45,363	2,576,783	1,024,393	3,601,176	4,037,252
1899	6	315,189	34,658	38,507	2,547,152	1,261,477	3,808,629	4,196,983
1900	6	361,716	34,279	50,380	2,869,480	1,521,031	4,390,511	4,836,886
1901	6	378,372	40,735	73,172	2,980,390	1,456,373	4,436,763	4,929,042
1902	6	394,011	38,120	72,731	3,202,695	1,593,019	4,795,714	5,300,576

Digitized by Google

Corresponding details relative to the average assets for the ten years are as follows:—

Year.	No. of Banks.	Average Assets in Western Australia.							
		Coined Gold, Silver, and other metals	Gold and Silver, in Bullion and Bars.	Government Securities.	Landed Property and Bank Premises.	Notes and Bills of other Banks.	Balanes due from other Banks.	Notes and Bills discounted and other Debts to Banks not before enumerated.	Total Average Assets.
		£	£	£	£	£	£	£	£
1893	5	431,316	25,590	7,500	106,706	7,133	5,702	2,196,840	2,780,787
1894	6	636,973	52,418	7,500	105,059	16,869	18,834	2,118,429	2,956,062
1895	6	1,200,582	76,894	7,500	103,625	31,199	142,987	2,385,662	3,948,449
1896	6	2,323,962	90,657	13,750	111,421	58,708	343,430	2,812,547	5,754,475
1897	6	2,102,831	132,165	116,000	136,481	37,328	104,187	3,349,806	5,978,798
1898	6	1,631,604	195,640	58,488	158,266	41,049	128,998	3,206,434	5,420,479
1899	6	1,527,902	238,484	43,118	181,199	53,343	124,523	2,817,465	4,986,034
1900	6	2,231,438	251,202	66,862	198,626	63,457	173,555	2,756,872	5,742,012
1901	6	2,056,540	321,515	81,689	202,238	63,506	157,951	3,061,330	5,944,769
1902	6	2,265,767	506,771	100,450	211,590	57,545	73,332	3,224,106	6,439,561

Digitized by Google

The following table furnishes a comparative statement of the total average liabilities and assets in this State of all the banks of issue for each of the past twelve years:—

Year.	Total Average Liabilities in Western Australia.	Total Average Assets in Western Australia.	Surplus Assets in Western Australia.
	£	£	£
1891	1,291,568	2,113,489	821,921
1892	1,525,783	2,625,989	1,100,206
1893	1,420,606	2,780,787	1,360,181
1894	1,805,936	2,956,082	1,150,146
1895	2,877,056	3,948,449	1,071,393
1896	5,083,273	5,754,475	671,202
1897	4,588,830	5,978,798	1,389,968
1898	4,037,252	5,420,479	1,383,227
1899	4,196,983	4,986,034	789,051
1900	4,836,886	5,742,012	905,126
1901	4,929,042	5,944,769	1,015,727
1902	5,300,576	6,439,561	1,138,985

It will be seen that the liabilities of the banks, owing principally to increased deposits, were added to so rapidly during the years 1895 and 1896, that in the latter year the total reached was £5,083,273. During the two succeeding years, a shrinkage in the amount of deposits, and also in the note circulation, brought about a decline to £4,037,252 in 1898. From that year onwards, an increase has been experienced, the total for 1902, viz., £5,300,576 being the largest on record. As regards the assets, a somewhat similar fluctuation has been experienced, but the high and low points are each a year later than in the case of the liabilities, the total for 1897 being £5,978,798, and that for 1899, £4,986,034. Since the latter year a continuous increase has been experienced, and the assets for 1902, £6,439,561, are higher than for any previous year.

The surplus assets may be taken as representing those portions of the capital and reserves of the several banks which are used in their business in this State, together with the difference between the amount raised elsewhere by the banks for investment here and the amount raised here for investment elsewhere. It may be noted, in connection with this matter, that in the case of two of the banks, viz., the Union Bank of Australia, Ltd., and the Bank of Australasia, the liabilities in this State for the year 1902 exceed the Western Australian assets while in the case of the other four banks the assets are in excess.

These surplus assets have fluctuated considerably, varying for the twelve years under review between a minimum of £671,202 in 1896 and a maximum of £1,383,227 in 1898.

Digitized by Google

Note Circulation.

Under the provisions of an Act passed by the Legislature of Western Australia in 1840 (4 Vic., No. 5), no bank notes may be issued for a smaller sum than one pound, nor for any sum involving a fraction of a pound. There are no figures available concerning the numbers of notes for different amounts in circulation, but there is not the least doubt that the one pound note is that most in use.

Under the provisions of "The Stamp Act, 1882," every bank of issue is required to pay quarterly to the Treasury a sum of ten shillings for every £100 of average note circulation during the preceding quarter, being at the rate of two per cent. per annum on the average yearly circulation.

No special reserve against note issue is required by law in this State, nor, indeed, is there any apparent necessity for such a regulation, when it is considered that for 1902 the average note circulation was only £394,011, while the average amount of coin and bullion held by the banks during the year was no less than £2,772,538.

Particulars for the years 1893 to 1902, relative to the amounts of notes in circulation and the corresponding amounts per head of mean population, are as follows:—

Year.	Average Yearly Note Circulation.			
	Amount.	Per Head of Mean Population		
	£	£	s.	d.
1893	84,698	1	7	6
1894	143,156	1	18	2
1895	214,679	2	7	8
1896	395,092	3	4	5
1897	374,993	2	8	3
1898	330,673	1	19	2
1899	315,189	1	17	5
1900	361,716	2	0	10
1901	378,372	2	0	2
1902	394,011	1	18	1

The average note circulation of the State attained a maximum in 1896, the amount for that year being £395,092. During each of the three succeeding years a decrease in circulation was experienced, with the result that the amount for 1899 stood as low as £315,189. Since then a continuous increase has been in operation, and the amount for 1902 (£394,011) falls little short of the 1896 record. The amount per head of mean population has varied considerably during the decennium, the highest (£3 4s. 5d.) being that for 1896, and the lowest (£1 7s. 6d.) for 1893. During the latter half of the period

Digitized by Google

however, the variation has taken place within fairly narrow limits, the average amount of note circulation per head for these five years being approximately £2.

Deposits.

Moneys deposited with the banks are placed either on "current account," and bear no interest, or at "fixed deposit" for a specified term, at a stipulated rate of interest. In the case of current accounts a charge of £1 1s. per annum, payable half-yearly, is made by the banks for each account.

The rates of interest paid during the years 1896 to 1902, on fixed deposits for twelve months, are as follows:—

Year.	Interest per Annum on Sums Deposited for twelve months.
	%
1896	3½
1897	3½
1898	3½ and 3
1899	3
1900	3
1901	3
1902	3

The rate paid on sums placed on fixed deposits for six months is usually one per cent. per annum below that paid on twelve months' deposits, while no interest is allowed for periods of less than six months.

The average amounts on deposit with the banks of issue in this State during each of the ten years, 1893 to 1902, are as follows:—

Year.	Average Amount of Deposits.					
	Not bearing Interest.		Bearing Interest.		Total.	
	Amount.	Percentage on Total Deposits.	Amount.	Percentage on Total Deposits.	Amount.	Per Head of Mean Population.
	£	%	£	%	£	£ s. d.
1893 ..	462,752	35·78	830,695	64·22	1,293,447	20 19 4
1894 ..	751,430	46·12	877,872	53·88	1,629,302	21 14 2
1895 ..	1,593,372	61·53	996,355	38·47	2,589,727	28 14 7
1896 ..	3,192,348	69·74	1,385,048	30·26	4,577,396	37 6 2
1897 ..	3,096,105	76·08	973,562	23·92	4,069,667	26 3 3
1898 ..	2,576,783	71·55	1,024,393	28·45	3,601,176	21 6 2
1899 ..	2,547,152	66·88	1,261,477	33·12	3,808,629	22 12 0
1900 ..	2,869,480	65·36	1,521,031	34·64	4,390,511	24 15 11
1901 ..	2,980,390	67·17	1,456,373	32·83	4,436,763	23 10 6
1902 ..	3,202,695	66·78	1,593,019	33·22	4,795,714	23 3 0

It will be seen from the above table that the total amount of deposits increased so rapidly during the first four years of the decennium under review that, for the year 1896, it stood at £4,577,396,

Digitized by Google

as compared with £1,293,447 for 1893. During 1897 and 1898, however, a rapid decline was experienced, the total for the latter year reaching only £3,601,176. This was followed by steady increases in each of the subsequent years, resulting in a total of £4,795,714 being attained for 1902, thus exceeding by no less than £218,318 the record for 1896.

Of the total amount on deposit, the proportion placed at interest has fluctuated considerably during the decennium, varying between the limits of 64 per cent. for 1893 and 24 per cent. for 1897. During the four years, 1899 to 1902, however, the variation has been very slight, the interest-bearing deposits being practically one-third of the total on deposit for each of these years.

The total amount of deposits per head of mean population of the State has also been subject to considerable variation, and has ranged between £20 19s. 4d., for 1893, and £37 6s. 2d., for 1896. In this case, also, the figures for the last four of the ten years under review are remarkably uniform, varying only between £22 12s. and £24 15s. 11d., and averaging for the four years £23 10s. 3d. per head of mean population.

As the form of banking return prescribed by Statute does not require "Government" to be distinguished from other deposits, the proportion of Government deposits contained in the foregoing figures cannot be ascertained. The amount of Government money on deposit with the several local banks at the end of each quarter is, however, published regularly by the Treasury, particulars for the ten years, 1893 to 1902, being as follows:—

Year.	Amount of Government Deposits with Local Banks on—			
	31st March.	30th June.	30th September.	31st December.
	£	£	£	£
1893	264,012	208,737	340,874	473,005
1894	417,446	370,909	379,999	343,808
1895	444,223	455,826	551,183	674,065
1896	796,509	1,011,839	1,019,310	546,836
1897	555,144	328,298	345,637	265,115
1898	301,776	438,964	494,215	421,616
1899	477,229	615,384	816,960	936,580
1900	1,036,621	791,168	834,296	680,497
1901	575,605	527,423	574,986	551,875
1902	585,535	471,241	672,147	507,061

Coin and Bullion.

Details concerning the amounts of coin and bullion held by the banks of issue in this State during each of the ten years, 1893 to 1902, are as follows, the percentages of such amounts on the total liabilities

Digitized by Google

at "call," that is, on the deposits not bearing interest and the note circulation, being also given :—

Year.	Average Amount of Coin and Bullion held in Western Australia.			
	Coin.	Bullion.	Total.	
			Amount.	Percentage on Liabilities at "Call" (Deposits not bearing Interest and Note Circulation).
	£	£	£	%
1893	431,316	25,590	456,906	83·46
1894	636,973	52,418	689,391	77·06
1895	1,200,582	76,894	1,277,476	70·65
1896	2,323,962	90,657	2,414,619	67·31
1897	2,102,831	132,165	2,234,996	64·39
1898	1,631,604	195,640	1,827,244	62·85
1899	1,527,902	238,484	1,766,386	61·71
1900	2,231,438	251,202	2,482,640	76·83
1901	2,056,540	321,515	2,378,055	70·80
1902	2,265,767	506,771	2,772,538	77·09

The amount of coin and bullion held by the banks has fluctuated somewhat during the ten years, but has, throughout the period, always represented a high percentage of the liabilities at "call," ranging between 62 per cent. for 1899, and 83 per cent., for 1893. The total amount for 1902 was £2,772,538, being the highest for any year in this State, while the percentage on "call" liabilities for that year was 77, ranking second to that of 1893.

Advances.

In addition to a specification of coin and bullion, provision is made in the banking returns for showing the other assets of the bank under five heads, comprising "Government Securities," "Landed Property and Bank Premises," "Notes and Bills of other Banks," "Balances due from other Banks," and "Notes and Bills Discounted and other debts to banks not before enumerated." Of these five groups the last named, which is very generally referred to as "Advances," is by far the most important, representing, for 1902 nearly 90 per cent. of the assets, exclusive of coin and bullion.

The amount shown under this head consists of the total of bills and promissory notes discounted, advances by way of legal or equitable mortgage, or on personal or other security, and other miscellaneous amounts owing to the banks. It is to be regretted that the forms prescribed make no provision for distinguishing the nature of these advances, such as exists with regard to the statements required from Life Assurance Companies, and that, in consequence, much valuable information which should be readily available relative to the trend

Digitized by Google

of banking business in the State is unobtainable. The same objection applies elsewhere; for instance, throughout the several States of Australia and the colony of New Zealand, the forms in use are, except for a few minor variations, practically identical with those in force here.

Particulars relative to the amount of advances for the ten years, 1893 to 1902, are as follow:—

Year.	Average Advances in Western Australia.		
	Amount.	Per Head of Mean Population.	Percentage on Total Deposits.
	£	£ s. d.	%
1893	2,196,840	35 12 3	169·84
1894	2,118,429	28 4 6	130·02
1895	2,385,662	26 9 3	92·12
1896	2,812,547	22 18 5	61·44
1897	3,349,806	21 10 8	82·31
1898	3,206,434	18 19 6	89·04
1899	2,817,465	16 14 4	73·98
1900	2,756,872	15 11 5	62·79
1901	3,061,330	16 4 8	69·00
1902	3,224,106	15 11 4	67·23

The total amount of advances reached its highest point in 1897, when it stood at £3,349,806. This was followed by a continuous decline in the three next years to £2,756,872 in 1900, succeeded by steady increases in 1901 and 1902, the total for the latter year being £3,224,106, or £125,700 below that for 1897.

A remarkable feature of this table is the practically continuous decline during the ten years shown in the amount of advances per head of mean population of the State, this amount falling from £35 12s. 3d. in 1893, to £15 11s. 4d. in 1902—the lowest point reached during the ten years. In the case of the percentage of advances on total deposits, also, the difference between the figures for the earlier and the later years of the decennium is very marked, the percentage having fallen from 170 in 1893 to 67 in 1902.

The discount rates charged by the banks during each of the seven years, 1896 to 1902, are as follow:—

Year.	Discount Rates on Bills having a Currency of	
	Three months and under.	Over three months.
	%	%
1896	5 to 9	5 to 9
1897	6 to 7½	7 to 8
1898	6 to 8	7 to 8
1899	6 to 8	7 to 8
1900	6 to 7	7 to 9
1901	6 to 7	7 to 9
1902	5 to 7	5 to 9

Digitized by Google

The following table gives the rates of exchange on drafts issued by the banks on the several States of the Commonwealth, on the Colony of New Zealand, and on London, for each of the seven years 1896 to 1902:—

Drafts Drawn.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
	Premium %	Premium %	Premium %	Premium %	Premium %	Premium %	Premium %
At sight on—							
New South Wales	¼ to ⅜	⅜	⅜	⅜	⅜	⅜	⅜
Victoria	¼ to ⅜	⅜	⅜	⅜	⅜	⅜	⅜
Queensland ..	1	1	⅜ to 1	1	1	1	1
South Australia	¼ to ⅜	⅜	⅜	⅜	⅜	⅜	⅜
Tasmania	1	1	1	1	1	1	1
New Zealand ..	1	1	1	1	1	1	1
London	2	2	2	1½ to 2	1½ to 1¾	1½	1½ to 1¾
At 60 days' sight on—							
London	⅞	⅞	⅞	¼ to ⅞	⅜ to ½	½ to ⅞	⅜ to ⅞

Similar particulars relative to the rates of exchange on bills purchased by the banks are as follow:—

Bills Drawn.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
	Discount %	Discount %	Discount %	Discount %	Discount %	Discount %	Discount %
At sight on—							
New South Wales	⅜	⅜	⅜	⅜	⅜	⅜	⅜
Victoria	⅜	⅜	⅜	⅜	⅜	⅜	⅜
Queensland ..	1	1	⅜ to 1	1	1	1	1
South Australia	¼ to ⅜	⅜	⅜	⅜	⅜	⅜	⅜
Tasmania ..	1	1	1	1	1	1	1
New Zealand ..	1	1	1	1	1	1	1
London	¼	¼	¼	par to ⅜	¼ to ⅜	¼	¼ to ¼
At 60 days' sight on—							
London	⅜	⅜	⅜ to ⅞	⅜ to 1¼	⅜ to 1¼	⅜	⅜

Capital.

The total paid-up capital of all the banks of issue operating in this State, as furnished in the returns for the quarter ended 31st December in each of the years 1893 to 1902, is as follows:—

Year.	Number of Banks.	Total Paid-up Capital on 31st December.
		£
1893	5	8,041,392
1894	6	10,449,690
1895	6	10,916,058
1896	6	11,216,439
1897	6	10,154,725
1898	6	10,208,954
1899	6	10,294,011
1900	6	9,915,105
1901	6	9,981,822
1902	6	8,910,302

Digitized by Google

The decreases shown as having taken place in the total paid-up capital during the years 1897, 1900, and 1902 were due to the writing off, by the two re-constructed banks, of a portion of their capital.

(*b.*) Post Office Savings Bank.

The earliest legislation relating to Savings Banks in this State was an Ordinance (18 Vict., No. 3) passed on the 12th April, 1855, "to provide for the encouragement, safe custody, and increase of "small savings in Western Australia." This measure, was, however, very short-lived, and remained in force but little more than a year, being repealed by an Ordinance passed on the 9th June, 1856 (19 Vict., No. 9).

In this latter enactment, which consists of one clause only, it is stated that the provisions of the previous Ordinance were "found to be inapplicable to existing circumstances," and that in consequence the whole of that Ordinance was repealed, "save and except so far as the same relates to the repayment of any moneys deposited and still being in the hands of the Colonial Treasurer, together with interest thereon."

Seven years after this the attempt to encourage small savings was again made by the legislature, when "The Post Office Savings Banks Ordinance" (27 Vict., No. 5) was passed on 1st July, 1863. Under this Ordinance the Post Office Savings Bank was established and provision was made that interest at the rate of 3¾ per cent. per annum should be paid on deposit, such interest to be computed on the minimum monthly balance of each account, exclusive of fractions of a pound, and to be added to the depositors' accounts on 31st December in each year. No mention was made of the maximum amount to be allowed on deposit, but, in the following year, on 11th July, 1864, an amending Ordinance (28 Vict., No. 1) was passed, which provided, amongst other things, that no depositor should be allowed to increase the amount standing to his credit with the bank by more than £30 in any one year, nor to more than £150 in all, and also that whenever, by the annual addition of interest, the sum standing in the name of any depositor should amount to £200 in all, no further interest would be allowed so long as the total remained as high as £200.

Additional amending enactments were passed in 1865 (29 Vict., No. 13), and in 1874 (38 Vict., No. 10), both of which related to the manner of investing the funds of the Bank.

These four measures were repealed by "The Post Office Savings Bank Consolidation Act, 1893" (57 Vict., No. 3), which consolidated and amended the law on the subject, and which was itself amended by Acts passed in 1895 (59 Vict., No. 5), in 1896 (60 Vict., No. 15), in 1900 (64 Vict., No. 10), and in 1902 (2 Edw. VII., No. 22).

Under the provisions of these Acts deposits may be made to the amount of one shilling and upwards, provided that the addition to a

Digitized by Google

depositor's principal does not exceed £150 during the course of any one year, and the total amount at the depositor's credit does not at any time exceed £600.

The rate of interest payable to depositors, which, in the Act of 1863, and also in that of 1893, is laid down at 3¾ per cent., remained at that figure until 1896, when the Colonial Treasurer, in accordance with power given him by the Amending Act of 1895, notified through the *Government Gazette* that on and after 1st July, 1896, the rate of interest would be 3 per cent.—the rate at present being paid. Interest is still computed on the minimum monthly balance exclusive of fractions of a pound. and is added to deposits annually on 30th June, but in the event of any account exceeding £300, no interest is allowed on such excess.

On the 1st March, 1901, the Postal Departments of the several States were taken over by the Commonwealth Government, and, in anticipation of this, the Savings Bank Amending Act of 1900 was passed by the Western Australian Legislature, to make such alterations in the principal Act of 1893 as would be rendered necessary by the transfer, the Colonial Treasurer being authorised therein to make, with the approval of the Governor, arrangements "with the postal authorities of the Commonwealth, that the officers of the Post Office shall perform, on such terms as shall be agreed upon, all or any part of the duties which have hitherto been performed by such officers in connection with the Post Office Savings Bank."

Such arrangements having been duly made, the business of the branches of the Bank is now carried on much as it was before the Commonwealth assumed control of the Postal Department. The head Office of the Bank, however, which is situated in Perth, is quite distinct from the Postal Department, all the officers being members of the State Public Service. All the accounts are kept at the Head Office, the branch business merely consisting in the transmission to Head Office of money deposited, and the payment of withdrawals on the receipt from the Head Office of the necessary funds. The privilege of withdrawing by telegraph has recently been extended to all the branches throughout the State.

Branches are now established (August, 1903) at the undermentioned places:—

Aberdeen Street, Perth	Collie	Fremantle, East
Albany	Coolgardie	Geraldton
Beverley	Cossack	Gingin
Bonnie Vale	Cottesloe	Goongarrie
Boulder	Cue	Greenbushes
Bridgetown	Day Dawn	Greenough
Brisbane Street, Perth	Denmark	Guildford
Broad Arrow	Derby	Jarrahdale
Broome	Dongara	Kalgoorlie
Bulong	Donnybrook	Kanowna
Bunbury	Esperance	Katanning
Burbanks	Fremantle	Kookynie
Carnarvon	Fremantle, South	Lake Austin
Claremont	Fremantle, North	Laverton

Digitized by Google

BRANCHES OF POST OFFICE SAVINGS BANK—*continued.*

Lawlers	Newcastle	Southern Cross
Leederville	Niagara	Subiaco
Lennonville	Norseman	Vasse
Leonora	Northam	Wagin
Menzies	Northampton	Waroona
Midland Junction	Paddington	Williams
Mingenew	Peak Hill	Wiluna
Mornington	Pingelly	Yalgoo
Mt. Magnet	Pinjarra	Yarloop
Mt. Morgans	Port Hedland	York
Mt. Malcolm	Ravensthorpe	Yundamindera
Nannine	Roebourne	
Narrogin	Smith's Mill	

In the following table are given particulars relative to the number of accounts and the amounts due to depositors from 1863, the year in which the bank was inaugurated, up to 30th June, 1902 :—

Date.	Number of Accounts remaining open.	Amount due to Depositors.	Average Amount standing to Credit of each Account.	Average Amount per head of Population of Western Australia.	Number of Accounts per 1,000 of Population.
	No.	£	£ s. d.	£ s. d.	No.
31st December, 1863	224	2,486	11 2 0	0 2 8	12
Do. 1864	633	6,391	10 1 11	0 6 7	33
Do. 1865	965	9,888	10 4 11	0 9 9	48
Do. 1870	895	13.582	15 3 6	0 10 10	36
Do. 1875	1,408	23,885	16 19 3	0 17 11	53
Do. 1880	1,299	22,724	17 9 10	0 15 8	45
Do. 1885	2,082	26.148	12 11 2	0 14 10	59
Do. 1890	3,014	34,616	11 9 8	0 14 11	65
30th June, 1895	8.374	221,816	26 9 9	2 3 10	83
Do. 1896	16,160	460,611	28 10 1	3 6 10	117
Do. 1897	26,317	856,084	32 10 7	5 5 11	163
Do. 1898	29,791	1,072,058	35 19 9	6 7 9	178
Do. 1899	29,371	1,116,178	38 0 1	6 10 10	172
Do. 1900	33,646	1,299,144	38 12 3	7 4 7	187
Do. 1901	39,318	1,618,359	41 2 9	8 6 1	202
Do. 1902	45,108	1,889,082	41 17 7	8 15 7	210

The increase in the business of the bank, whether considered from the point of view of the number of accounts or of the amount due to depositors, has during the seven years, from 30th June, 1895, to 30th June, 1902, been phenomenal. During that period the number of accounts increased considerably more than fivefold, while the increase in the amount of deposits for the same time was nearly ninefold. The average amount standing to the credit of each account rose, during the seven years, from £26 9s. 9d. to £41 17s. 7d.

In the earlier years of the Bank the amounts on deposit were small, ranging, on the average, from £10 to £17 ; and it was not until the year 1893 that so high an average as £20 was attained. In later years, however, the accounts have increased in magnitude, and for the years 1900-1 and 1901-2 they averaged more than £40.

A feature of considerable interest in this matter is the manner in which the ratio of accounts to population has increased. Although the number of accounts probably exceeds the number of depositors,

Digitized by Google

owing to trust accounts for friendly societies and for other purposes being allowed by the Savings Bank legislation, the excess would presumably not be large, and it may consequently be stated that, whereas in 1895 one person in every twelve in Western Australia was a Savings Bank depositor, in 1901 and 1902 one person in every five had an account with the bank.

The average amount of Savings Bank deposits per head of population of the State, has increased from 2s. 8d. at the end of 1863, the Bank's first year of business, to £8 15s. 7d. on 30th June, 1902. In this case, also, the greatest increase has been that experienced in recent years, as the amount of deposits per head of population did not reach £1 until 1892.

While the increase in the amount due to depositors has, during the past ten years, been large, the magnitude of the bank's business cannot be gauged by this alone, as such increase represents only the net results of extensive deposits and withdrawals together with the interest added to the accounts from time to time. Particulars relative to the amounts deposited and withdrawn, the interest allotted, and the cost of management, for each year since 1892, are as follows:—

Year.	Number of Offices.	Amount Deposited.	Amount Withdrawn.	Excess of Deposits over Withdrawals.	Interest Allotted.	Total additions to Amount due to Depositors.	Cost of Management.
	No.	£	£	£	£	£	£
1892	20	54,611	40,658	13,953	1,856	15,809	611
1893*	23	39,212	27,437	11,775	1,161	12,936	330
1893–4	24	146,387	83,509	62,878	3,516	66,394	} 2,644
1894–5	24	217,930	143,679	74,251	6,245	80,496	
1895–6	31	520,016	291,744	228,272	10,523	238,795	2,820
1896–7	38	1,068,322	690,183	378,139	17,334	395,473	4,224
1897–8	55	1,231,638	1,042,521	189,117	26,857	215,974	7,064
1898–9	59	1,057,023	1,042,751	14,272	29,848	44,120	6,572
1899–1900	67	1,112,251	962,371	149,880	33,086	182,966	6,544
1900–1	69	1,333,376	1,053,938	279,438	39,777	319,215	6,751
1901–2	76	1,534,010	1,311,347	222,663	48,060	270,723	4,283

*Half-year to 30th June.

Digitized by Google

The following is a statement of the liabilities and assets of the bank on the 30th June in each of the years, 1901 and 1902 :—

Particulars.	30th June, 1901.	30th June, 1902.
LIABILITIES.	£	£
Balance due to Depositors	1,618,359	1,889,082
At Credit of Profit and Loss Account ..	2,467	2,566
Total	1,620,826	1,891,648
ASSETS.		
Mortgages on Freehold	86,337	82,979
Municipal Debentures	27,500	31,500
Government Securities	609,855	887,021
Advances to Metropolitan Waterworks Board	388,264	395,917
Cash in W.A. Bank	484,643	445,432
Cash in hand	24,227	48,799
Total	1,620,826	1,891,648

The Profit and Loss Accounts for the years ended 30th June, 1901 and 1902, are as follows :—

Particulars.	30th June, 1901.	30th June, 1902.
DR.	£	£
Departmental Expenses	6,751	4,283
Interest allotted to Depositors	39,777	48,060
Transferred to Revenue	8,855	2,467
Balance	2,467	2,566
Total	57,850	57,376
CR.		
Balance from previous year	8,855	2,467
Interest on mortgages	39,605	46,612
Interest on balance with W.A. Bank ..	9,324	8,225
Other Receipts	66	72
Total	57,850	57,376

(c.) INSURANCE.

1.—*Life Assurance.*

The only Act dealing specially with Life Assurance which appears on the Statute Book of Western Australia is "The Life Assurance Companies Act, 1889" (53 Vict., No. 12), which was assented to on the 4th December, 1889. This Act is, to a large extent, based upon the Imperial Acts known as "The Life Assurance Companies Acts, 1870 to 1872;" in fact, it may be said to consist of these Acts,

Digitized by Google

with a few amendments necessary to meet local conditions, and a few additions.

The returns to be furnished to the Registrar of Companies by the Life Assurance Companies transacting business in this State are provided for in the schedules to the Act, and these, with the exception of the fifth, which is a new one, are almost identical with the schedules to the Imperial Acts mentioned; the principal difference being that under the local Act the assets held by each Company must be separated, so as to show under each of the heads specified in the second and fourth schedules the assets held in Western Australia and elsewhere.

Minor points of difference occur in the first schedule, where the item which appears as "Commission" in the Imperial Act is required by the local Act to be separated, so as to show Commission on New Premiums and Renewals; and in the sixth schedule, where an additional query as to the table of mortality and rate of interest, according to which the net premiums valued have been computed, is inserted in the local Act.

The returns thus differ but little, with the exception of those required under the fifth schedule, from the returns under the Imperial Acts; and in the case of the sixth and seventh schedules it is provided in Section 21 that a copy of the corresponding returns deposited in accordance with the provisions of the Imperial Act with the Board of Trade may be deposited at the office of the Registrar in lieu of those prescribed.

The rules for valuing Annuities and Policies in the case of a Company being wound up, which appear in the first schedule of the Imperial "Life Assurance Companies Act, 1872," are retained as the eighth schedule to the local Act, and the second schedule to the Imperial Act mentioned is incorporated in the body of the local Act as Section 58.

Every Company commencing or carrying on the business of life assurance in Western Australia is by this Act required to deposit with the Colonial Treasurer approved securities to the value of £10,000; a proviso being made, however, that in the case of any local Company the amount required to be deposited should not exceed 50 per cent. of the amount of premiums actually received by the Company.

There are at present eight Life Assurance Companies carrying on business in this State, of which three—The Australian Mutual Provident Society, The Mutual Life Association of Australasia, and The Citizens' Life Assurance Company, Limited—have their head offices in Sydney; two—The Colonial Mutual Life Assurance Society, Limited, and The National Mutual Life Association of Australasia—have their head offices in Melbourne; while the remaining three—The Equitable Life Assurance Society of the United States, the

Digitized by Google

Mutual Life Insurance Company of New York, and the Independent Order of Foresters—are American Companies, the two former having their head offices in the United States, and the latter in Canada.

The Citizens' Life Assurance Company, Limited, undertakes Industrial as well as Ordinary Assurance, and is the only Company in Western Australia carrying on this class of business, the distinctive features of which are that the sums assured are small, and the premiums payable at short intervals, usually weekly.

The following is a summary of the Liabilities and Assets of the several Assurance Companies on 31st December, 1901, compiled from particulars furnished in accordance with the second schedule of "The Life Assurance Companies Act, 1889":—

Liabilities.

Name of Company.	Assurance and Annuity Funds.	Other Liabilities.	Total Liabilities.
	£	£	£
Australian Mutual Provident Society ..	17,349,896	947,136	18,297,032
Citizens' Life Assurance Company, Ltd. { Ordinary ..	491,601	6,414	498,015
Citizens' Life Assurance Company, Ltd. { Industrial ..	278,847	23,929	302,776
Colonial Mutual Life Assurance Society, Ltd.	2,499,113	101,246	2,600,359
Equitable Life Assurance Society of the U.S.	68,460,046	506,562	68,966,608
Independent Order of Foresters	..	1,055,802	1,055,802
Mutual Life Association of Australasia ..	1,533,693	11,717	1,545,410
Mutual Life Assurance Company of New York	71,975,777	493,982	72,469,759
National Mutual Life Association of Australasia, Ltd*	3,265,126	134,105	3,399,231

* Liabilities on 30th September, 1901.

Assets.

Name of Company.	Assets in Western Australia.	Assets elsewhere.	Total.
	£	£	£
Australian Mutual Provident Society ..	1,165,920	17,131,112	18,297,032
Citizens' Life Assurance Company, Ltd. { Ordinary ..	25,667	472,348	498,015
Citizens' Life Assurance Company, Ltd. { Industrial ..	2,442	300,334	302,776
Colonial Mutual Life Assurance Society, Ltd.	46,576	2,553,783	2,600,359
Equitable Life Assurance Society of the United States	29,690	68,936,918	68,966,608
Independent Order of Foresters	10,000	1,045,802	1,055,802
Mutual Life Association of Australasia ..	21,665	1,523,745	1,545,410
Mutual Life Insurance Company of New York	12,201	72,457,558	72,469,759
National Mutual Life Association of Australasia, Ltd.*	144,040	3,255,191	3,399,231

* Assets on 30th September, 1901.

The Companies operating in this State are required by the Act to furnish annual returns of Revenue and Expenditure, classified

Digitized by Google

in accordance with the form provided in the first schedule. These returns for the year ended 31st December, 1901, have been summarised in the following statement:—

Revenue.

Name of Company.	Premiums new and renewal, less reassurance premiums.	Consideration for Annuities granted.	Other Receipts.	Total.
	£	£	£	£
Australian Mutual Provident Society ..	1,583,686	60,102	812,601	2,456,389
Citizens' Life Assurance Co., Ltd. { Ordinary	149,476	1,479	17,565	168,520
Citizens' Life Assurance Co., Ltd. { Industrial	172,916	..	11,197	184,113
Colonial Mutual Life Assurance Society Ltd.	313,651	..	99,165	412,816
Equitable Life Assurance Society of the United States	9,763,895	281,590	3,561,736	13,607,221
Independent Order of Foresters ..	488,576	..	37,938	526,514
Mutual Life Association of Australasia	184,569	17,818	65,947	268,334
Mutual Life Insurance Company of New York	9,931,184	667,352	3,669,308	14,267,844
National Mutual Life Association of Australasia, Ltd.*	388,056	26,174	152,187	566,417

* Year ended 30th September, 1901.

Expenditure.

Name of Company.	Claims under Policies, less sums reassured.	Surrenders.	Annuities.	All other Expenditure.	Total.
	£	£	£	£	£
A.M.P. Society	982,339	315,605	36,527	287,249	1,621,720
Citizens' { Ordinary	20,372	8,313	944	31,237	60,866
Citizens' { Industrial	41,901	1,748	..	99,799	143,448
Colonial Mutual	201,852	21,144	1,192	84,748	308,936
Equitable of United States ..	3,673,025	1,202,785	144,685	3,104,355	8,124,850
I.O.F.	325,335	..	..	64,389	389,724
Mutual of Australasia ..	92,733	12,047	2,879	64,594	172,253
Mutual of New York ..	4,534,314	634,583	323,555	3,306,310	8,798,762
National Mutual*	243,887	54,994	4,309	90,971	394,161

* Year ended 30th September, 1901.

Under Section 18 of the Act, returns relating to new business, discontinuances, and existing policies are required to be furnished annually by the Companies in the form provided in the fifth schedule. In each case particulars of each of the three classes of business—Assurance, Endowment, and Annuity—are required. The new policies issued must further be divided so as to show separately those issued in Western Australia and elsewhere; the discontinuances so as to show those discontinued "by death or maturity," "by surrender," and "by forfeiture"; and the existing policies so as to show the existing business in each of the Australian States, the Colony of New Zealand, and elsewhere.

Digitized by Google

In the following table are shown the particulars of the new policies issued in Western Australia during 1901 by each of the Companies :—

Name of Company.	Year in which Branch was established in Western Australia.	New Policies issued in Western Australia during 1901.					
		Assurances.		Endowments.		Annuities.	
		No. of Policies.	Sum Assured.	No. of Policies.	Sum Assured.	No. of Policies.	Annuity per Annum.
		No.	£	No.	£	No.	£
A.M.P. Society ..	1884	449	160,700	4	600	2	134
Citizens' Ordinary ..	1890	355	82,150	62	7,625	..	..
Citizens' Industrial ..	1890	2,285	63,031	..	..	..	..
Colonial Mutual ..	1874	125	27,317	8	800	..	..
Equitable of U.S. ..	1885	384	155,134	2	300	2	155
I.O.F.	1901	127	34,600	..	..	..	..
Mutual of A'asia ..	1896	95	47,931	14	4,600	..	..
Mutual of N.Y. ..	1896	78	32,950	..	..	..	..
National Mutual* ..	1888	227	61,800	36	5,100	..	..
Total ..	..	4,125	665,613	126	19,025	4	289

*Year ended 30th September, 1901.

It will be seen that of the 4,125 new Assurance policies issued in this State during 1901, 2,285 (or 54 per cent.) were Industrial, the sum assured thereby being £63,031, or less than 10 per cent. of the total sum assured by the new Assurance policies. No Industrial, Endowment, or Annuity business was done during the year.

Particulars concerning the amount of new business (exclusive of Industrial) done in Western Australia, during each of the five years 1897 to 1901, are as follows :—

Year.	New Policies issued in Western Australia (exclusive of Industrial).					
	Assurances.		Endowments.		Annuities.	
	No. of Policies.	Sum Assured.	No. of Policies.	Sum Assured.	No. of Policies.	Annuity per Annum.
	No.	£	No.	£	No.	£
1897 ..	1,513	559,980	70	9,050	1	4
1898 ..	1,707	582,336	107	14,250	..	..
1899 ..	1,600	504,494	158	14,150	..	..
1900 ..	1,751	580,044	110	12,025	2	220
1901 ..	1,840	602,582	126	19,025	4	289

Digitized by Google

Corresponding particulars relative to new Industrial policies issued in this State during the five years are as follows :—

Years.	New Industrial Policies issued in Western Australia.			
	Assurances.		Endowments.	
	No. of Policies.	Sum Assured.	No. of Policies.	Sum Assured.
	No.	£	No.	£
1897 ..	1,075	57,700	938	27,868
1898 ..	1,338	45,009	156	4,480
1899 ..	1,597	49,282	..	..
1900 ..	2,672	71,662	..	..
1901 ..	2,285	63,031	..	..

The number and amount of policies on the Western Australian registers of the several companies on 31st December, 1901, are given in the following table :—

Name of Company.	Policies existing in Western Australia on 31st December, 1901.					
	Assurances.		Endowments.		Annuities.	
	No. of Policies.	Sum Assured.	No. of Policies.	Sum Assured.	No. of Policies.	Annuity per Annum.
	No.	£	No.	£	No.	£
A.M.P. Society	5,896	1,999,181	33	3,850	3	254
Citizen, Ordinary	1,528	297,389	338	32,500	..	..
Citizen, Industrial	8,028	222,293	542	15,274	..	..
Colonial Mutual	696	173,697	23	3,600	..	..
Equitable of U.S.A. ..	1,064	458,343	8	1,000	2	155
I.O.F.	127	34,600	..	..	..	..
Mutual of Australasia ..	532	196,213	31	6,200	..	..
Mutual of New York ..	279	115,000	3	300	..	..
National Mutual*	1,913	475,420	151	18,700	..	..
Total ..	20,063	3,972,136	1,129	81,424	5	409

*30th September, 1901.

Of the total of 20,063 Assurance policies existing in Western Australia, no fewer than 8,028, or 40 per cent. were Industrial, the amount assured by them being £222,293, or about 5½ per cent. of the total sum assured. In the case of Endowment policies, 542 out of a total of 1,129, or 48 per cent., were Industrial, and assured £15,274, or about 19 per cent. of the total amount covered by Endowment policies.

It may be advisable to point out that the Endowments shown in this and other tables in this chapter are pure Endowments, assuring the payment of a sum on the attainment of a given age. Endowment

Digitized by Google

Assurances which provide for payment of the sum assured at a given age or previous death are included under the head of Assurances. In view of the enormous world-wide extension that has been taking place in this latter form of business within recent times, it would be of interest to analyse the particulars for this State so as to show separately the number and amount of policies for "Whole life Assurances," "Endowments Assurance," and "Other Assurances," but, unfortunately, the returns furnished in accordance with the Act do not supply the requisite information. The alterations which would be required in the existing schedules in order to obtain this information would not be very extensive, and would simply consist in providing space for the three special heads mentioned above, in place of the general head "Assurances" at present used. The information required would, presumably, be readily available in the books of all Life Assurance Companies.

In the following table are given the number and amount of policies (exclusive of Industrial) in existence in Western Australia on 31st December of each of the five years, 1897 to 1901 :—

Date.	Policies (exclusive of Industrial) existing in Western Australia on 31st December.					
	Assurances.		Endowments.		Annuities.	
	Number of Policies.	Sum Assured.	Number of Policies.	Sum Assured.	Number of Policies.	Annuity per Annum.
	No.	£	No.	£	No.	£
31st Dec., 1897	7,859	2,593,182	307	34,550	2	125
" 1898	9,026	2,925,506	384	44,650	1	121
" 1899	9,814	3,107,020	476	49,925	1	121
" 1900	10,830	3,402,455	518	55,775	3	341
" 1901	11,908	3,749,843	587	66,150	5	409

Similar particulars relative to the number and amount of Industrial policies for the five years are as follows :—

Date.	Industrial Policies existing in Western Australia.			
	Assurances.		Endowments.	
	No. of Policies.	Sum Assured.	No. of Policies.	Sum Assured.
	No.	£	No.	£
31st December, 1897 ..	4,765	152,189	1,079	29,078
Do. 1898 ..	5,152	155,555	797	21,073
Do. 1899 ..	5,630	165,286	638	17,802
Do. 1900 ..	7,175	202,417	599	17,141
Do. 1901 ..	8,028	222,293	542	15,274

Digitized by Google

In the following table are given details for this State concerning the amount assured per policy under Assurance and Endowment policies combined, the amount assured per head of population, and the number of policies per 1,000 of population, on 31st December in each of the five years, 1897 to 1901, Ordinary and Industrial business being shown separately :—

Date.	Assurance and Endowment Policies existing in Western Australia.					
	Ordinary.			Industrial.		
	Amount Assured per Policy.	Amount Assured per Head of Population.	Number of Policies per 1,000 of Population.	Amount Assured per Policy.	Amount Assured per Head of Population.	Number of Policies per 1,000 of Population.
	£	£ s. d.	No.	£	£ s. d.	No.
31st Dec., 1897 ..	322	16 5 0	51	31	1 2 5	36
Do. 1898 ..	316	17 14 0	56	30	1 1 1	35
Do. 1899 ..	307	18 10 0	60	29	1 1 5	37
Do. 1900 ..	305	19 4 10	63	28	1 4 5	43
Do. 1901 ..	303	19 8 1	64	28	1 4 5	44

It will be seen that the amount of Assurance per head, and the number of policies per 1,000 of population have, in the cases both of the Ordinary and the Industrial business in this State, increased considerably during the period under review.

On the other hand, the average amount assured per policy has during the period exhibited a marked tendency to decline, the average in the case of Ordinary business falling from £322 to £303 during the four years, from 31st December, 1897, to 31st December, 1901, while the average per Industrial policy has correspondingly declined from £31 to £28.

It is, of course, impossible to tell from the returns how many policy-holders are represented by the number of policies shown, since in some instances one person may be the holder of two or more policies. Assuming, however, that the number of such cases is not proportionately large, it appears that, approximately, in 1901, one person in every sixteen of the population was the holder of an ordinary policy, while one in every twenty-three was an Industrial policy holder.

It may be mentioned that, when in the foregoing pages reference has been made to the totals for the State for the year ended 31st December, the figures given include in each case particulars relative to the National Mutual Life Association for the year ended 30th September, that being the date on which this Company's financial year closes.

Digitized by Google

II.—*Fire Insurance.*

The following British, Colonial, and Foreign Fire Insurance Companies are represented in Western Australia, and registered under the Companies Act:—

British.

Alliance
Atlas
Commercial Union
Lancashire
Liverpool and London and Globe
London and Lancashire
London Assurance
Manchester
North British and Mercantile
Northern
Norwich Union
Palatine
Phœnix
Royal
Royal Exchange
State
Sun
Union
Yorkshire

Colonial.

Australian Alliance
City Mutual
Colonial Mutual
New Zealand
North Queensland
South British of New Zealand
United
Victoria

Foreign.

Aachen and Munich
Madgeburg

All these Companies have their Head Offices for the State in Perth, with the exception of three, viz., the Australian Alliance, the London Assurance, and the State, which are located at Fremantle.

III.—*Marine Insurance.*

The following is a list of the Marine Insurance Companies who are doing business in this State:—

Name of Company.	Address of Representative.
Alliance	Fremantle
Australian Alliance	Do.
China Traders	Perth
Commercial Union	Do.
Colonial Mutual	Do.
Canton	Fremantle
Marine Insurance Co. of London ..	Do.
New Zealand	Perth
Nord Deutsche	Fremantle
North Queensland	Perth
South British	Do.
Triton	Fremantle
Union Insurance Company of Canton ..	Do.
United Insurance Company	Perth
Victoria	Do.
World Marine	Fremantle

IV.—*Accident Insurance.*

The Accident Insurance Companies represented in this State are as follows:—

Ocean Accident.	Commercial Union.
Colonial Mutual.	New Zealand Accident.

The offices of the representatives of these Companies are situated in Perth.

Digitized by Google

PART VI.—SOCIAL.

(*Information supplied by C. R. P. Andrews, M.A., Inspector General of Schools.*)

1.—EDUCATION.

ESTABLISHMENT OF SYSTEM.—The statutes in force relating to public instruction in Western Australia are the Elementary Education Act of 1871, with the Amending Act of 1893; "The Assisted Schools Abolition Act, 1895," and "The Public Education Act, 1899."

GENERAL FEATURES.—The system is compulsory and free, the school fees having been abolished by "The Public Education Act, 1899." The teaching in the Government schools is secular; but general religious teaching is given, which, by "The Amendment Act, 1893," is classed under "secular" instruction. The text-books in this subject are the Irish National series. By the same Act ministers of religion are permitted, under certain regulations, to teach the children of their own denomination for half-an-hour during school hours.

MANAGEMENT.—By "The Amendment Act, 1893," the Central Board of Education, which for over 20 years had administered the Education Acts, was abolished, and the Department was placed under the charge of a specially constituted Minister of Education, who is assisted by various District Boards acting generally as Boards of Advice. The franchise for election of District Boards is very liberal. Householders of £10 annual value, or the parent or guardian of any child attending a school receiving State aid, are entitled to be placed on the Electoral Roll. Members of these Boards are elected for the term of three years; but in the event of vacancies occurring through resignation, or otherwise, the vacancies are filled by the Governor. On the Goldfields, where no Boards have been elected, Committees of School Management have been appointed in several districts. The members are appointed by the Governor in Council on the recommendation of the Minister. Their duties are analogous to those of District Boards of Education. In the case of some few schools in outlying parts of the State, the Resident Magistrate for the District assists the Department.

TEACHERS.—Teachers in Government schools are appointed by the Governor; but the Minister has power delegated to him to make certain minor appointments.

All teachers appointed to Government schools are expected, either upon appointment or within a reasonable time thereof, to qualify for a certificate; but in certain cases certificates are granted on the qualifications already held. Both schools and certificates are classified, and the teachers' salaries are regulated by this classification. The number of teachers employed in Government schools at the end of the year 1899 was 124 male and 70 female head teachers; 41 male and 95 female assistants; 8 male and 52 female pupil teachers; seven

Digitized by Google

male and 36 female monitors, and 40 sewing mistresses: total, 473. At the end of 1900, there were 129 male and 78 female head teachers; 48 male and 125 female assistants; 10 male and 77 female pupil teachers; seven male and 39 female monitors; and 38 sewing mistresses: total, 551. At the end of 1901, there were 148 male and 74 female head teachers; 62 male and 130 female assistants; 23 male and 98 female pupil teachers; five male and 37 female monitors; and 48 sewing mistresses: total, 625. At the end of 1902 there were employed 160 male and 74 female head teachers; 67 male 158 female assistant teachers; 20 male and 69 female pupil teachers; 14 male and 55 female monitors, and 60 sewing mistresses; total, 677 teachers.

At the end of 1900 and 1901 there were also employed a teacher of manual training (wood-working and metal-working), with two pupil teachers, and a teacher of cookery. At the end of 1902 two additional teachers of manual training were employed, and two of cookery, making eight in all.

TRAINING COLLEGE.—Formerly, the State laboured under a great disadvantage in not being able to train its own teachers, and thus was compelled to rely for its supply of trained teachers on the other States. This disability has, however, now been removed by the establishment of a Training College. The College was formally opened on the 30th January, 1902. The resident staff consists of the Principal and two assistants. Lectures are also given by special teachers in normal work, kindergarten, domestic economy, needlework, and manual training. The number of students at the end of April, 1902. was 41 (30 males and 11 females); of these, 28 were resident in the college, while 13 were day students. Candidates for training are selected in a competitive examination, and the course is for three years.

SCHOLARSHIPS.—There are annually offered for competition among boys between 11 and 13 years of age attending the elementary schools, three scholarships, each of the value of £50 per annum, tenable for three years at a secondary school recognised as such by the Department for this purpose. Bursaries for boys and girls, each of the value of £10, tenable for one year at an elementary school under the Act, are also annually offered for competition among children attending Government schools or other efficient schools where the average fee does not exceed one shilling per week. Five junior exhibitions of the value of £15 each, and five senior of the value of £25 each, are annually competed for by boys and girls between the ages of 14 and 18 years. In 1900 a further exhibition was added, called the Government University Exhibition, of the value of £150 a year, tenable for three years. This is competed for by boys under 19 years of age, and is awarded conditionally on the winner entering into residence at a recognised University of the British Empire.

The junior exhibitions are awarded on the results of the Adelaide Junior Public Examination, and the senior exhibitions and the

University Exhibition on the combined results of the Adelaide Senior and Higher Public Examinations.

STATISTICS FOR 1899, 1900, 1901, AND 1902.—The number of Government schools in operation at the close of these years was 205, 218, 233, and 245, respectively. The enrolment was 16,053, 18,557, 20,548, and 22,765, and the average attendance 12,465, 14,463, 16,423, and 18,448 for same periods.

The percentage of average attendance to the average or mean enrolment for the year 1899 was 79; for 1900 and 1901, 81; and for 1902, 82.

FINANCIAL.—The total expenditure for the year ended 31st December, 1899, was £62,028; for 1900, £78,031; for 1901, £93,153; and for 1902, £109,197. The expenditure on rents and buildings was £2,256 in 1899, £1,989 in 1900, £872 in 1901, and £946 in 1902. The expenditure on Bursaries, Scholarships, and Exhibitions was £648 in 1899, £676 in 1900, £730 in 1901, and £1,059 in 1902. The expenditure on Evening Schools, including those at Perth and Fremantle, was £541, £1,071, and £969 for 1899, 1900, and 1901 respectively, and £880 for 1902. On Technical Education the expenditure was £770 for 1899, £964 for 1900, £1,432 for 1901, and £3,231 for 1902. On Manual Training and Cookery classes the expenditure was £343 for 1899, £571 for 1900, £1,136 for 1901, and £1,568 for 1902. The stock purchased in 1899, 1900, and 1901 cost £2,729, £3,764, and £3,275 respectively, and £3,570 in 1902. The expenses of the Training College in 1901, came to £1,062, and to £3,753 in 1902.

The net charge to the State for the upkeep of Government schools amounted to £56,099 in 1899, £68,794 in 1900, £83,677 in 1901, and £97,139 in 1902. The foregoing amounts are made up as follows for each year:—(1) Cost of administration, including departmental salaries, examining fees, District Boards, compulsion; and (2) Teachers' salaries and grants, teachers' travelling expenses, school furniture, maintenance, and apparatus. Under the first head, in 1899, the sum of £9,516 was expended; in 1900, £9,749; in 1901, £9,983; and in 1902, £10,389; and under the second head £46,583 in 1899, £59,045 in 1900, £73,694 in 1901 and £86,750 in 1902. The expenditure by the Public Works Department on school buildings was £10,878 for 1899; £26,762 for 1900; £37,841 or 1901; and £27,555 for 1902.

The amount received from Government schools in 1899, 1900, and 1901 was, respectively, as follows:—Book sales, rents, etc., £801, £1,136, and £1,183. Evening school fees, £239, £255, and £220. Technical school fees for 1900 amounted to £161, and for 1901 to £221. The day school fees, which were abolished from the 7th October, 1899, amounted for the first nine months of 1899 to £3,475. In 1902 the amount from book sales, etc., was £1,323; that from Evening School fees, £140; from Technical School fees, £404; and from Training College fees, £136.

Digitized by Google

The cost per head, calculated on the average attendance of the children enrolled, administration being included, was :—

	£	s.	d.		£	s.	d.
1899	4	12	5	1901	5	1	0
1900	4	17	3	1902	5	1	10

When the average or mean enrolment of scholars is taken as the basis of calculation, the cost per head, including administration, was :—

	£	s.	d.		£	s.	d.
1899	3	11	9	1901	4	1	10
1900	3	19	0	1902	4	3	1

The table hereunder shows the cost, exclusive of administration.

Table showing Enrolment, Average Attendance, and Cost per Head, in Government Schools, in comparison with former years.*

Year.	No. of Schools.	Enrolment. †	Average enrolment for year.	Average Attendance during each year.†	Per-centage.	Cost per Head of average attendance.†			Cost per Head of mean enrolment.†		
						£	s.	d.	£	s.	d.
1892	96	4,032	..	2,902	72	3	3	1½	‡		
1893	106	4,280	..	3,088	72	3	8	8	‡		
1894	116	5,037	..	3,552	71	3	6	1	‡		
1895	133	6,451	..	4,685	73	3	14	6	‡		
1896	150	9,008	..	6,470	72	3	10	6	‡		
1897	167	12,262	a11,493	8,976	b78	3	10	6	‡		
1898	186	14,424	14,495	10,915	75	3	12	7	‡		
1899	207	16,053	15,689	12,465	79	3	17	9	3	0	4
1900	223	18,557	18,055	14,663	81	4	6	11	3	8	5
1901	242	20,548	20,277	16,423	81	4	9	0	3	12	1
1902	250	22,765	22,605	18,448	82	4	10	9	3	14	1

* Not including administration. † Including schools closed during the year. ‡ Not available for these years. *a.* Not ascertained previous to 1897. *b.* From and including 1897, the percentage of attendance to enrolment has been calculated on the basis of "average attendance" to "average enrolment."

Under the Education Act, the Minister is empowered to expend an annual sum not exceeding £4 10s. per head, calculated upon the aggregate average daily attendance of all children above the age of four years and under the age of 16 years attending the Government schools, and an additional sum up to five shillings per head for books, etc.

COMPULSION.—The year 1899 was marked by the passing of an entirely new Act, "The Public Education Act, 1899," which contains measures for dealing with compulsion reaching considerably farther than those in previous Acts. Among these may be mentioned:—the forbidding of employment of children of school age during school hours, except by special permission of the Minister; providing for the registration and efficiency of private schools; empowering a census to be taken of all children within any district; requiring children of compulsory age to attend every school day; making age, and not "standard passed," the ground of exemption from attendance at school. Under this Act the Minister is empowered to grant exemption from attendance to children between 12 and 14 years of age in case of poverty or sickness of parents. During 1899 exen

tions were applied for in 60 cases, of which 50 were granted. Prosecutions to the number of 108 were authorised, with the following results:—Fined, 83; cautioned, and costs inflicted, 10; sent to Industrial School, 12; dismissed, 1; withdrawn, 2. In 1900, 90 applications for exemption were received, of which 59 were granted; 266 summonses also were issued against parents, with the following results:—Fined, 186; cautioned, 55; withdrawn, 2; committed to Industrial School, 21; dismissed, 2. In 1901, 82 applications for exemption were received, and 44 granted; summonses were issued in 190 cases, with the following results:—Fined, 135; cautioned, 28; withdrawn, 5; committed to Industrial School, 22. In 1902, 84 applications for exemption were received, of which 51 were granted; 205 prosecutions were authorised, with the following results:—Fined, 129; cautioned and costs inflicted, 41; dismissed, 7; withdrawn, 4; committed to Industrial Schools, 24.

University and Technical Education.—Western Australia has no University at present, though the establishment of one in the near future is now under consideration; the Perth Technical School has, however, become affiliated with the Adelaide University. Lectures are at present being given to enable students to prepare for their degrees in Arts and Science. The authorities of the Adelaide University hold annually their primary, junior, and senior public examinations, their music examinations, and their examinations for the B.A. and B.Sc. degrees as candidates offer themselves. The results may be seen from the following particulars supplied by the Secretary of the West Australian Centre of the University of Adelaide:—

No. of Certificates gained.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
Public Examinations.							
Preliminary	11	21	29	51	84	*d* 7	
Primary	..	..	..	..	..	103	105
Junior	7	5	*a* 8	*a b* 23	*a c* 35	*a b* 37	*a b* 41
Senior	..	1	6	6	7	*c* 8	6
*e*Higher	..	..	..	2	..	4	9
Degree Examinations.							
*e*B.A., B.Sc., etc	..	..	..	..	4	9	6
Music Examinations.							
Theory.							
Primary	..	..	4	..	..	2	1
Junior	..	..	..	2	..	1	4
Practice.							
Primary	..	..	..	..	9	13	9
Junior	..	..	..	..	3	14	2
Senior	..	..	..	..	1	3	2
School Examinations.							
Practice.							
Elementary Division	..	..	..	..	..	..	17
Lower	..	..	..	..	..	..	10
Higher	..	..	..	..	..	..	6
Total	18	27	47	84	143	201	218

a One candidate gained 1st University Prize, £10. *b*. One candidate gained 2nd University Prize, £5. *c* One candidate gained 3rd University Prize, £3. *d* Held in March only, now abolished, and Primary held instead. *e* In the Higher Public and Degree Examinations the number of candidates who passed in [illegible] subjects is given.

Digitized by Google

All the examinations held by the Adelaide University are under the control and management of a local committee.

Candidates for the Matriculation Examination of the Melbourne University can also be examined locally. In 1901, arrangements were completed whereby candidates may present themselves in this State for the examinations leading up to the B.A. and LL.B. degrees of the London University, and in 1902 the B.Sc., B.S. (Economics), and B.D. degrees were added to this list. A local committee also arranges public courses of University Extension Lectures in Perth.

The Technical School, which has been referred to above in connection with the Adelaide University, was opened on the 16th May, 1900. During that year classes were held in chemistry, assaying, mineralogy, carpentry, metal-working, wood-carving, and drawing. The success of the first year's work was so marked that early in 1901 a physical laboratory, a new chemistry lecture-room, and a metallurgical plant were erected, and the buildings were otherwise added to. The year 1901 witnessed also a further growth in the work of the school, as, besides the structural additions noted above, a physical lecture-room, two new assaying rooms (one for volumetric, and one for fire work), a large balance-room, a room for plumbing-work, and one for fitting and turning, were erected. Classes also were held in the following subjects:—Mathematics, geology, agriculture, assaying, chemistry, physics, art, wood-carving, metal-working, carpentry, mechanical drawing, and mineralogy.

During the last term of the years 1900, 1901, and 1902 the total enrolment was 66, 99, and 168 respectively. The staff for 1900, 1901, and 1902 numbered seven, nine, and fourteen respectively, including the Director. The revenue consisted of:—For 1900, fees, £152; other sources, £8 11s. 4d.; for 1901, fees £214; other sources, £7 2s. 3d.; for 1902, fees, £404; other sources, £10. The disbursements for 1900 amounted to £964, for 1901 to £1,432, and for 1902, to £3,231. These last amounts include maintenance and apparatus.

Evening Classes.—In the last issue of the Year Book, reference was made to these classes as having been established with the following objects:—(1) Continuation classes, in which the subjects taught in elementary schools might be carried to a further and wider extent, and in which more advanced subjects might be introduced; and (2) a means by which might be gauged the success of a fully-developed technical course, and a basis on which such might later on be established. The second of these objects, as will be seen from the foregoing reference to Technical Education, was brought to a practical issue; and there is no doubt that, in Perth at least, the establishment of the Technical School detracted largely from the importance

of the evening classes. Some of the classes were, in fact, transferred to the Technical School, as being more properly within its province. These remarks, however, do not apply to the same extent as regards Fremantle, where the classes are still largely technical in character. In both places (Perth and Fremantle) very good work has continued to be done.

The following statistics relating to them should prove of interest :—

	No. of Individual Students at end of year.		Staff at end of year.		Finance.	
	Males.	Females.	Males.	Females.	Fees received.	Disbursements.
					£ s. d.	£ s. d.
Perth, 1900	106	35	7	3	221 12 0	736 17 11
" 1901	71	32	5	3	185 17 6	618 8 3
" 1902	71	80	5	4	133 8 6	487 10 2
Fremantle, 1900 ..	116	..	5	1	157 4 0	401 11 7
" 1901 ..	105	23	6	1	238 6 2	548 2 2
" 1902 ..	133	27	8	2	307 2 0	368 13 0

Examinations continue to be held at the end of each year.

The following subjects are taken at the Perth evening classes :—Reading, arithmetic, English and composition, dictation and writing, mensuration, French, Latin, book-keeping, shorthand, geography, history, drawing, and dress-cutting. In Fremantle the following additional subjects are taken :—Trigonometry and Euclid, geometrical drawing, machine drawing, applied mechanics, electric engineering, and the steam-engine. A class in dress-cutting has not yet been established at Fremantle.

On the 10th September, 1902, Technical and Evening classes were opened at Boulder, and the results, so far, have been very satisfactory.

PRIVATE SCHOOLS.—At the close of the year 1899 there was a grand total of 83 private schools in Western Australia; and during 1900 these decreased to 75. A total of 77 were open at the end of 1901, and at the end of 1902 the number was 80. They are all, with the exception of the Boys' High School, which is subsidised by the Government and under the supervision of a Board of Governors, self-supporting. Prior to 1895 a certain number of private schools received State aid, but by the Assisted Schools Abolition Act of that year the grants to private schools was discontinued, and a compensation was made to the schools that had so far received sub-

Digitized by Google

sidy, the sum of £15,000 being divided among them in proportion to the grants received during the year 1895. Under the provisions of "The Public Education Act, 1899," the principals of private schools may apply to have their schools inspected and declared "efficient." Under this Act all private school principals are required to keep registers of attendance.

The undenominational schools in the years 1899, 1900, 1901, and 1902 numbered, respectively, 44, 33, 31, and 33; the male teachers, 15, 10, 11, and 12; the female teachers, 94, 69, 66, and 69; the scholars on the roll, 1,290, 1,055, 1,041, and 1,116.

The Anglican Church had, at the end of 1899, under its supervision and control, six private schools, under the charge of one male and 14 female teachers; the number of scholars on the roll was 182. At the end of 1900 there were four schools, with a staff of one male and six female teachers, and an enrolment of 67 scholars. At the end of 1901 there were six schools, with a staff of one male and 18 female teachers; the enrolment was 203. At the end of 1902 there were three schools, with a staff of 10 female teachers; the enrolment was 113.

Under the supervision of the Roman Catholic Church there were, at the close of 1899, 32 schools, with five male and 138 female teachers; the enrolment of scholars was 4,118. At the close of 1900 the number of schools was 37; of the staffs, 16 male and 142 female teachers, and of the scholars 4,233. At the close of 1901 there were 38 schools, with staffs aggregating 22 male and 157 female teachers, the enrolment being 4,473. At the close of 1902 there were 43 schools, with 25 male and 174 female teachers; the enrolment was 4,921.

The Presbyterian Church has a boys' school located in Perth. At the end of 1899 there were four male teachers and 95 scholars. At the end of 1900 the number of teachers remained the same, but the enrolment had increased to 107. At the end of 1901 there were five teachers and 93 scholars, and at the end of 1902, four teachers and 110 scholars.

SECONDARY SCHOOLS.—The conditions governing scholarships, which formerly could be held at the Perth Boys' High School only, have been altered so that at the present time a successful competitor may select from among the schools approved by the Department the one which he wishes to attend.

The schools thus approved are, for the purposes of the Department, termed *Secondary Schools*. The following are the schools so

Digitized by Google

classed at present, but they are only provisionally approved, and any may be omitted, or others added :—

Undenominational ..	Perth Boys' High School Guildford Grammar School. The Perth High School for Girls.
Roman Catholic Church	Christian Brothers' College, Perth. Convent of Notre Dame des Missions, Highgate Hill.
Presbyterian Church ..	Scotch College, Perth.

The Perth High School is subsidised by the Government, out of the general revenue, by the grant of an annual sum of £1,000. It was established by statute in 1876. The governors are a corporate body, and are empowered to hold lands, goods, and benefactions in trust for the school. They are six in number, and are appointed by the Governor in Council. They are endowed with power to make by-laws and regulations for the management of the school. The instruction is exclusively secular, and the Head Master must be a graduate of a recognised University, but not a minister of religion. Provision is also made whereby the masters may be required to take in pupils as boarders upon certain terms. All accounts of the school are once a year audited by the Auditor General, and an annual report of the condition and prospects of the school is laid before Parliament. It received during the fiscal year ended 30th June, 1900, a Government grant of £1,000, £1,083 in the year ended 30th June, 1901, and £1,000 in the following year, Receipts from other sources during these respective years were £1,152, £1,156, and £1,403. Expenditure for same periods amounted to £2,170, £2,234, and £2,326. The number of regular teachers employed at the end of each year was five, and the enrolment numbered 75, 96, and again 96, for 1900, 1901, and 1902 respectively.

The Guildford Grammar School is a private institution. At the end of 1900 there were 47 pupils in attendance: at the end of 1901, 50; and at the end of 1902, 44. The staffing for each year was three male teachers and one female teacher.

The High School for Girls is not connected with any church in particular. The number of pupils at the end of 1901 was 65, and the number of teachers, six; at the end of 1902 the number of teachers was the same, whilst the number of pupils had increased to 72.

The Christian Brothers' College and the Notre Dame Convent are under the control of the Roman Catholic Church. The numbers of pupils and staffing were as follows:—Christian Brothers' College, at the close of 1900, 150 pupils, 8 teachers; at the close of 1901, 149

Digitized by Google

pupils. 8 teachers; at the close of 1902, 154 pupils. 8 teachers. Notre Dame Convent, at the close of 1900, two teachers. 30 pupils; at the close of 1901, three teachers. 59 pupils; at the close of 1902. 3 teachers, 80 pupils.

The Scotch College, at Perth, is under the control of the Presbyterian Church. Its attendance and teaching staff have been referred to above.

2.—RELIGION.

Prior to 1895 certain denominations which then embraced the greater portion of the population, and consequently were considered to be the most important in Western Australia, were entitled to an annual State grant. These were:—The Church of England; the Roman Catholic Church; the Wesleyan Church; the Presbyterian Church; and the Congregational Church. Only the first four, however, actually claimed and received such aid. The practice was abolished in 1895, when an Act was passed which provided for a sum of £35,430 being paid, in two instalments, in commutation of the previous annual ecclesiastical grant. These were paid, the one in 1895, the other in 1896; the amount allotted to each denomination being in proportion to its numerical strength at the 1891 Census. The total amount paid to the Church of England was £20,042; whilst the Roman Catholics received £10,086; the Wesleyans, £3,687; and the Presbyterians, £1,615.

Although not now a matter of importance in connection with the administration of public funds, a knowledge of the distribution of the population according to religious profession is of such great and general interest that it will always probably be considered one of the prominent features of every recurring Census.

The great increase of the population of Western Australia during the decade preceding the Census of 1901 caused an equally considerable increase in the number of sects recorded at the enumeration of the people. In the 1891 Census provision had to be made for 63 different heads under which to classify the population in this respect: the number at the 1901 Census had risen to more than 150. On both occasions, however, some of these heads were evidently of a purely fanciful nature, the result of a perverted and misplaced sense of humour.

A comparison of the particulars for each of the two Censuses shows, it will be seen, a large increase in the numbers under every one of the clearly-defined heads.

Digitized by Google

Religion.	Census of 1891.		Census of 1901.		Males and Females.		Percentage of number under each head on total specified.		Number of Females to each 100 Males.	
	Males.	Females.	Males.	Females.	1891.	1901.	1891.	1901.	1891.	1901.
CHRISTIAN—										
Church of England ..	14,548	10,229	45,027	30,627	24,768	75,654	50·35	42·02	70·25	68·02
Methodist	2,446	2,159	13,969	10,571	4,605	24,540	9·36	13·63	88·27	75·67
Presbyterian	1,286	711	9,252	5,455	1,997	14,707	4·06	8·17	55·29	58·96
Congregational	822	751	2,406	1,998	1,573	4,404	3·20	2·45	91·36	83·04
Baptist	170	113	1,625	1,289	283	2,914	0·57	1·62	66·47	79·32
Church of Christ ..	63	35	534	511	98	1,045	0·20	0·58	55·56	95·69
Salvation Army ..	4	..	971	719	4	1,690	0·01	0·94	..	74·05
Lutheran	195	21	1,401	302	216	1,703	0·44	0·95	10·77	21·56
Seventh Day Adventist ..	2	..	101	110	2	211	..	0·12	..	108·91
Unitarian	29	10	116	34	39	150	0·08	0·08	34·48	29·31
Protestant (undefined) ..	155	95	1,206	641	250	1,847	0·51	1·02	61·29	53·15
Roman Catholic ..	7,122	5,343	24,623	15,961	12,465	40,584	25·34	22·54	75·02	64·82
Greek Catholic	9	..	170	2	9	172	0·02	0·09	..	1·18
Catholic (undefined) ..	69	68	840	469	137	1,309	0·28	0·73	98·55	55·83
Other Christians ..	46	17	323	238	63	561	0·13	0·31	36·96	73·68
NON-CHRISTIAN—										
Jew, Hebrew, Israelite	83	47	755	504	130	1,259	0·26	0·70	56·63	66·75
Mahomedan	421	6	1,176	15	427	1,191	0·87	0·66	1·43	1·28
Buddhist	1,030	50	656	105	1,080	761	2·20	0·42	4·85	16·01
Confucian	9	..	74	..	9	74	0·02	0·04	..	..
Others	12	1	129	28	13	157	0·03	0·09	8·33	21·71
INDEFINITE—										
No Denomination ..	152	32	1,450	411	184	1,861	0·37	1·03	21·05	28·34
Freethinker	286	22	1,219	106	308	1,325	0·63	0·73	7·69	8·70
Agnostic	8	1	99	7	9	106	0·02	0·06	12·50	7·07
Others	9	1	95	50	10	145	0·02	0·08	11·11	52·63
NO RELIGION—										
Atheist	8	..	32	3	8	35	0·02	0·02	..	9·38
No Religion	197	13	1,100	266	210	1,366	0·43	0·76	6·60	24·18
Pagan	146	142	252	12	288	264	0·58	0·15	97·26	4·76
Others	1	..	7	3	1	10	..	0·01	..	42·86
Total specified ..	29,328	19,858	109,608	70,437	49,186	180,045	100·00	100·00	67·71	64·26
"OBJECT TO STATE" ..	379	99	2,429	624	478	3,053	..	..	26·12	25·69
UNSPECIFIED	100	18	838	188	118	1,026	..	..	18·00	22·43
Grand Total	29,807	19,975	112,875	71,249	49,782	184,124	..	..	67·01	63·12

It will be seen that the percentage of the number under each definite head has been calculated on the total persons whose denominations were distinctly specified. If it may be assumed that those unspecified, and those who objected to answer the religious question all came under the specified heads in similar proportion to those who distinctly stated their beliefs, the percentages may be safely taken to be those of each denomination to the total population. It is on this assumption that they are so referred to in the following paragraphs. In some denominations the percentage of the number of adherents, on the total of the persons

Digitized by Google

whose religious convictions were specified, had considerably decreased; whilst a change in the opposite direction may be observed in others. The percentages, for instance, of Presbyterians and Methodists present the latter feature in a marked degree. There also was in many instances a striking change in the proportion between the numbers of males and females under the various heads of classification according to religion.

The adherents of the Church of England totalled 75,654, amounting to 42 per cent. of the total population, and being by far the largest number recorded for any one denomination. The males largely exceeded the females, outnumbering them in the proportion of 100 to 68; a proportion, however, somewhat less than that for the total population of the State, the figures for which were 100 males to 63 females.

The Roman Catholic Church, with a total of 40,584, occupied, from a numerical standpoint, second place amongst the religious denominations of the State, the percentage on the total population being about 22½; while, if to the Roman Catholics be added those persons returned simply as "Catholic," the majority of whom belonged presumably to the Roman Catholic Church, the total will be increased to 41,893, and the percentage to 23¼. In the cases both of Roman Catholics and Catholics (undefined), the number of females to each 100 males was small, being 65 in the former and 56 in the latter instance.

The total number professing adherence to the various sects of the Methodist Church was 24,540, or rather more than 13½ per cent. of the total population, the position of the Church, on the basis of numerical strength, being consequently third. The proportion of females amongst the Methodists was considerably higher than was the case with either the Church of England or the Roman Catholic Church, the number to each 100 males being about 76.

In point of numbers, the Presbyterian denomination ranks fourth, its adherents, 14,707, aggregating somewhat more than 8 per cent. of the total population. As regards sex distribution, the males preponderate here to a greater extent than in the case of any other of the larger denominations, there being only 59 females to each 100 males.

The fifth denomination, according to numerical rank, was the Congregational Church, with a following of 4,404, or slightly less than 2½ per cent. of the total population. The distribution of sexes in the case of adherents of this denomination shows a much closer approach to equality than in that of some of the others, there being 83 females to each 100 males.

Sixth in point of numbers comes the Baptist Church, with a record of 2,914, or somewhat more than 1½ per cent. of the total population. In this denomination the number of females to each 100 males was 79.

The next in order was the Lutheran Church, with a total of 1,703 adherents, followed closely by the Salvation Army, with 1,690, each

of these denominations claiming somewhat less than one per cent. of the total population. The distributions of the sexes in them were, however, very dissimilar; for while the Salvation Army showed 74 females to each 100 males, the Lutheran Church numbered less than 22 females to each 100 males. This is, no doubt, accounted for by the fact that the Lutheran Church is largely composed of foreign immigrants, most of whom are males.

With the exception of the two vaguely defined groups of "Protestant (undefined)" and "Indefinite," and that comprising persons of "No Religion," none of the groups in the table other than those already mentioned contained as many as ¾ per cent. of the total population—Jews, with a total of 1,259 (0·70 per cent.); Mahomedans, with 1,191 (0·66 per cent.); and Buddhists, with 761 (0·42 per cent.), being the most largely represented.

Two of the smaller Christian denominations are of special interest, as furnishing the only instances of near approach to equality in the distribution of the sexes. These are the Church of Christ, with a total of 1,045 adherents, and 96 females to each 100 males, and the Seventh Day Adventists, with a following of 211, and a record of 109 females to each 100 males—the sole exception to the otherwise invariable preponderance of males.

The failure to return themselves as adherents of some well-known denomination was more noticeable amongst males than amongst females, the greatest number of females to each 100 males in the case of any of the four groups, "Indefinite," "No Religion," "Object to State," and "Unspecified," being less than 26.

Of the 561 persons grouped as "Other Christians," those set down as "Brethren" (37); "Christadelphians" (52); "Christian Brethren" (37), and "Plymouth Brethren" (72), aggregated 198; while 71 were returned simply as "Christians," and 36 as adherents of the Catholic Apostolic Church.

Of those grouped under the head of "Indefinite," 1,861 were returned as of "No Denomination"; 1,325 as "Freethinkers"; 106 as "Agnostics," and 61 as "Spiritualists"; the remaining 84 being spread over no fewer than 29 different designations, many of them of a more or less fanciful nature.

The largest contributors to the "No Religion" group were those so returned on the Schedules, numbering 1,366 out of the total of 1,675 in this group. Persons to the number of 264, who were returned on the various schedules as "Pagan," have been classed with those of "No Religion," since it appeared that these terms were in many cases treated as being synonymous by those responsible for filling in the schedules. It is probable that the number in this group is somewhat overstated, since careful inquiry would doubtless, in some cases, have shown that persons returned by the householders as of "No Religion" had really some form of religious belief. As, however, the furnishing of a reply to the religious query on the Schedules was optional, no steps were taken by the Census Office to

Digitized by Google

have any information under this head referred back for correction, the particulars being tabulated as nearly as practicable as originally supplied. Included in this group are 35 persons who returned themselves as "Atheists," 32 being males, and three females.

Classified according to the four great territorial divisions, the particulars for the adherents of the principal denominations are here given in tabular form:—

Religion.	Metropolitan Division.		South-Western Division.		Central and Eastern Division.		Northern and North-Western Division.		Total.		
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Total.
CHRISTIAN—											
Church of England	14,945	12,743	14,450	10,775	14,297	6,745	1,335	364	45,027	30,627	75,654
Methodist	4,101	3,775	3,482	3,009	6,285	3,766	101	21	13,969	10,571	24,540
Presbyterian	3,468	2,778	1,720	1,069	3,822	1,588	242	20	9,252	5,455	14,707
Congregational	1,625	1,496	390	320	352	174	39	8	2,406	1,998	4,404
Baptist	706	676	406	289	497	320	16	4	1,625	1,289	2,914
Church of Christ	305	313	71	69	158	129	..	..	534	511	1,045
Salvation Army	282	259	277	217	408	243	4	..	971	719	1,690
Lutheran	428	119	316	64	599	114	58	5	1,401	302	1,703
Seventh Day Adventist ..	34	50	66	58	1	2	..	..	101	110	211
Unitarian	58	18	21	7	37	9	..	..	116	34	150
Protestant (undefined) ..	720	462	89	48	380	128	17	3	1,206	641	1,847
Roman Catholic	6,987	6,140	6,817	5,191	9,835	4,472	984	158	24,623	15,961	40,584
Greek Catholic	68	2	17	..	84	..	1	..	170	2	172
Catholic (undefined) ..	378	297	71	34	381	138	10	..	840	469	1,309
Other Christians	152	150	51	43	84	42	36	3	323	238	561
NON-CHRISTIAN—											
Jew, Hebrew, Israelite ..	455	338	80	51	215	115	5	..	755	504	1,259
Mahomedan	165	2	39	2	374	4	598	7	1,176	15	1,191
Buddhist	191	3	72	..	67	33	326	69	656	105	761
Confucian	21	..	40	..	1	..	12	..	74	..	74
Others	35	19	26	1	29	7	39	1	129	28	157
Indefinite	764	267	537	175	1,375	121	187	11	2,863	574	3,437
No Religion	181	40	286	95	389	30	535	119	1,391	284	1,675
"Object to state"	660	281	478	156	1,176	185	95	2	2,429	624	3,053
Unspecified	373	81	201	35	177	67	87	5	838	188	1,026
Total	37,122	30,309	30,003	21,708	41,023	18,432	4,727	800	112,875	71,249	184,124

The four divisions referred to in the above table are arranged as follows:—The Metropolitan division, to include the Magisterial Districts of Perth and Fremantle; the South-Western, those of Blackwood, Collie, Katanning, Murray, Northam, Plantagenet, Sussex, Swan, Toodyay, Victoria, Wellington, Williams, and York; the Central and Eastern, those of Broad Arrow, Coolgardie, North Coolgardie, North-East Coolgardie, Dundas, Esperance, Mount Margaret, Murchison, East Murchison, Peak Hill, Phillips River, Yalgoo, and Yilgarn: and the Northern and North-Western, those of Ashburton, Broome, Gascoyne, East Kimberley, West Kimberley, Kimberley Goldfields, Pilbara, and Roebourne. Each of these divisions has its distinctive features. The Metropolitan division embraces the Capital City and its suburbs, as well as the principal Port; the South-Western is the chief agricultural and timber producing division; the Central and Eastern division is largely devoted to gold mining; while pearling and pastoral pursuits are those mostly engaging attention in the Northern and North-Western division. It must, of course, be understood that most of these distinctions are only roughly applicable, and that the principal industry of each division is in most cases represented to some extent in other divisions.

Of the twenty-four religious groups shown in our statement, twelve were more largely represented in the Metropolitan than in any of the other divisions, these being the Church of England, Presbyterians, Congregationalists, Baptists, Church of Christ, Unitarians, Protestants (undefined), Catholics (undefined), Other Christians, Others (Non-Christian), and "Unspecified." Six of the groups, viz.: the Roman Catholics, Methodists, Salvation Army, Lutherans, Greek Catholics, "Indefinite," and "Object to State," preponderated in the Central and Eastern division, the first two of these being particularly numerous. In the North and North-Western division, Mahomedans, Buddhists, and "No Religion" were more strongly represented than in the other divisions.

It is of interest to note that in the case of the male adherents of the Church of England the numbers in the Metropolitan, the South-Western, and the Central and Eastern divisions were very nearly equal to one another.

A further point of interest is the fact that out of a total of 5,338 persons in the Northern and North-Western division, concerning whom particulars relative to religion were supplied, 1,057, or nearly 20 per cent., were adherents of Non-Christian religions, while 654, or rather more than 12 per cent., were returned as of "No Religion;" the former representing more than 30 per cent. of the total number of adherents of Non-Christian religions in the whole State, and the latter 39 per cent. of the "No Religion" total.

At the beginning of the year 1902, the number of churches and buildings used for divine worship, and the number of ministers for

Digitized by Google

each of the principal denominations represented in Western Australia, were as follows:—

	Denomination.	Total number of Churches and Buildings used for Divine Worship.	Number of Ministers, Clergymen, etc.	Number of Lay Readers, Local Preachers, etc.
Christian.	(a) Anglican Church ..	247	55	114
	Roman Catholic Church ..	170	58	..
	(b) Wesleyan Methodist Church	157	34	118
	Presbyterian Church ..	30	16	17
	Congregational Church ..	37	14	29
	Baptist Union	32	10	36
	Baptist Association of W.A.	10	4	16
	(c.) Associated Churches of Christ	9	4	12
	Seventh Day Adventists ..	11	3	8
	Salvation Army	30	88	242
	German Evangelical Lutheran Church	8	1	..
	Total Christian ..	741	287	592
Other.	Hebrew Congregation ..	7	3	9
	Mahomedans	9	2	5
	Grand Total ..	757	292	606

(a) Easter, 1902. (b) 30th September, 1901. (c) 28th February, 1902.

Church of England.

The Diocese, until quite recently, comprised the entire State of Western Australia, but a new diocese has now been created, which is called the South-Western Diocese, and forms a unit of the prospective ultimate subdivision of the North Diocese of Perth into the following four dioceses:—

1.—Missionary Diocese of the North.
2.—Diocese of Perth.
3.—Diocese of Kalgoorlie.
4.—South-Western Diocese.

The South-Western Diocese, comprises the Magisterial Districts of Blackwood, Collie, Katanning, Murray, Plantagenet, Phillips River, Sussex, Wellington, Williams, and such portion of York as is bounded on the North by a line drawn due East from Rockingham; and for the present the Northern District, which embraces the Gascoyne Magisterial District and the remainder of the State to the North, is placed under the supervision of the North-Western Bishop.

The Synod—organised in 1872—is constituted as follows:—President, the Bishop; all licensed clergymen, also two lay members for each clergyman.

Digitized by Google

All Church property is invested in a trust corporation, under Act of Parliament.

The greater part of the patronage—subject to the Bishop's confirmation—is vested in a Board of Nominees, two (Diocesan) appointed by the Synod, and three (Parochial) elected by the parish vestry. In other cases the patronage rests solely with the Bishop.

STATISTICAL INFORMATION.—It is stated by the Church authorities that there were 98 churches throughout the State at the close of the year 1902, besides 101 schoolrooms and other buildings used for Divine worship. The clergymen number 56 and there are eight stipendiary readers. During the year 1902 there were 1,818 baptisms, 649 confirmations, 568 marriages, and 837 burials; communicants enrolled, 5,627.

There are schools connected with the churches at Perth and Kalgoorlie.

REVENUE.—Local contributions and stipend, £10,118; offertories, £7,705; grant from S.P.G., £1,137; grant from Colonial and Continental Church Society, £200; Interest, General Sustentation Fund, £1,380; local endowments, £296 (not including self-supporting parishes).

ROMAN CATHOLIC CHURCH.

(*Province of Adelaide.*)

DIOCESE OF PERTH.—This diocese comprises all that part of the State of Western Australia South of the 28th parallel of South latitude. The mission started in 1843 with the arrival of two priests sent by the first Bishop of Sydney.

DISTRICTS.—The diocese is divided into the districts of Albany, Bunbury, Collie, Coolgardie, Greenbushes, Jarrahdale, Katanning, Kalgoorlie, Kanowna, Menzies, Norseman, Newcastle, Northam, Perth, Southern Cross, Swan and York.

ABBEY NULLIUS OF NEW NORCIA.—Founded 1st March, 1846, by two Spanish Benedictine Monks, Rev. Fathers Joseph Serra and Rosendo Salvado. The mission is located about 82 miles North of Perth, 15 miles from Mogumber, a station on the Midland Railway. The territory comprises 16 square miles in area and immediately surrounds the abbey.

DIOCESE OF GERALDTON.

(*Established in* 1898.)

The diocese includes all that portion of the State North of parallel 28 South latitude, including the districts of Geraldton, Greenough, Cue, Roebourne, Cossack, Derby, Wyndham, etc.

Digitized by Google

VICARIATE APOSTOLIC OF KIMBERLEY.

Erected into a separate vicariate in 1887, this district is temporarily under the jurisdiction of the Bishop of Geraldton. A mission for aborigines was established at Beagle Bay in 1890 by two Trappist Fathers. There are now nine priests and ten lay brothers in the community.

There are 27 convent schools for girls and infants, located at Albany, Boulder. Bunbury, Collie, Coolgardie, Fremantle, Geraldton, Guildford, Kalgoorlie, Leederville, Menzies, Newcastle, Northam, North Perth, Perth, Subiaco, West Perth, and York. There is one boys' school at Fremantle, one at Perth, and also a college under the control of the Christian Brothers.

At the end of 1901 there were in this State 60 churches and 110 other buildings used by this denomination as places of public worship, under the charge of 58 clergymen.

THE METHODIST CHURCH OF AUSTRALASIA.

The Methodist Church in Western Australia consists of a Union formed in 1902, of the Wesleyan, Primitive Methodist, and Bible Christian Churches.

STATISTICS.—Church members, 2,562; churches, 67; sittings in churches, 12,000; Sunday-school scholars, 7,141; officers and teachers, 692; ministers, 33; local preachers, 124; Total number of adherents, 25,000.

PRESBYTERIAN CHURCH IN WESTERN AUSTRALIA.

The first Presbyterian Church in the State was established in Perth in 1879. In 1892 the churches, four in number, were formed into a Presbytery of the Presbyterian Church of Victoria. In 1901 the Church became autonomous, the first general Assembly meeting in April of that year.

PRESBYTERIES.—Under the General Assembly there are three Presbyteries. The Perth Presbytery comprises six charges and two preaching stations. The Fremantle Presbytery comprises six charges and two preaching stations. The Eastern Goldfields Presbytery comprises five charges and four preaching stations.

HOME MISSION DISTRICTS.—There are five districts worked under the Home Mission scheme;—Great Southern Line, South-Western line, Avon Valley, Geraldton and Murchison district, and Eastern goldfields. Each district is placed under a superintendent.

STATISTICS.—There are 17 ordained ministers; the number of Sabbath-schools is 27; the communicants on the roll number 1,180, and the adherents on the roll, 2,200. The revenue for 1902 was £6,500.

Digitized by Google

3.—INDUSTRIAL LEGISLATION.

(By Edgar T. Owen, F.S.S., Registrar of Friendly Societies. Government Actuary, etc.)

The following is a list of the Statutes now in force in this State which relate to industrial matters:—

Associations Incorporation Act, 1895.
Benefit Building Societies Act, 1863.
Breach of Contracts about Fisheries Act, 1847.
Chinese Immigration Restriction Act, 1889.
Coal Mines Regulation Act, 1902.
Conspiracy and Protection of Property Act, 1900.
Early Closing Act, 1902.
Employers' Liability Act, 1894.
Employment Brokers' Act, 1897.
Fisheries Act, 1899.
Friendly Societies Act, 1894.
Goldfields Act, 1895, etc.
Hawkers and Pedlars Act, 1892.
Immigration Restriction Act, 1897.
Imported Labour Registry Act, 1897
Industrial Conciliation and Arbitration Act, 1902.
Masters and Apprentices Act, 1873.
Masters and Servants Act, 1892.
Mines Regulation Act, 1895 and 1899.
Mining Development Act, 1902.
Mining on Private Pr perty Act, 1898.
Pearl Shell Fishery Regulation Act, 1875, etc.
Public Institutions and Friendly Societies Lands Improvement Act, 1892.
Seats for Shop Assistants Act, 1899.
Steam Boilers Act, 1897.
Sunday Labour in Mines Act, 1899.
Trade Unions Act, 1902.
Truck Act, 1899.
Workers' Compensation Act, 1902.
Workmen's Wages Act, 1898.

The Industrial Conciliation and Arbitration Act.

"Attempts to deal with labour disputes, and settle them by means of arbitration or conciliation, are an evidence of advancing civilisation. The evolution of industry required them—necessitated them." (G. Howell, on "*Labour Legislation, Labour Movements, and Labour Leaders.*")

The Parliament of Western Australia has, following New Zealand's lead, made an attempt in this direction, by passing into law the Industrial Conciliation and Arbitration Act.

This statute came into force on the 5th December, 1900, and on the 19th February, 1902, was replaced by the present Act, "The Industrial Conciliation and Arbitration Act, 1902."

The purpose of such legislation, as expressed in the full title of the 1900 Act, is "to facilitate the settlement of industrial disputes by conciliation and arbitration."

Digitized by Google

The general administration of the Act is, under the Minister (the Attorney General), assigned to the Registrar of Friendly Societies.

For the purposes of the Act, the State of Western Australia is divided into three industrial districts. Each district is provided with a Board of Conciliation of five persons (the Act allows 3, 5, or 7), consisting of two representatives elected by the registered unions of employers, two elected by the registered unions of workers, and a chairman, elected by the four representatives. Each Board retains office for three years.

Besides these three permanent Boards, special Boards of Conciliators may be elected from time to time by the parties to a dispute, to deal with cases of a special character.

The Court of Arbitration, on the results of whose labours will depend in a large measure the ultimate success of the Act, has jurisdiction over the whole State. It consists of three members, the President, who must be a Judge of the Supreme Court, and two representatives, nominated respectively by the registered unions of employers and workers.

The Act provides for the registration thereunder of unions of employers and unions of workers, composed respectively of not less than two and 15 members each.

Every registered union (styled in the Act "an Industrial Union") must be confined to some one specified industry, and must adopt such rules as are in full compliance with the Act. There must not be more than one industrial union in a locality in the one industry. In addition to Industrial Unions, the act recognizes Industrial Associations and Trades and Labour Councils representing a number (not less than two) of industrial unions each.

An Industrial Association is composed of Industrial unions which are not necessarily all of the same industry, and there is no limit to the number of Industrial Associations which may be registered.

One Trades and Labour Council only may, however, be registered in each industrial district, and it must consist of industrial unions (not necessarily of the one industry) which are not represented upon an Industrial Association.

Every Industrial Union must be composed of either "employers" or "workers," these terms being defined thus:—

The term "employer" includes persons, firms, companies, and corporations, employing one or more workers.

The term "worker" means any person of the age of 16 years and upwards, of either sex, employed, or usually employed by any employer, to do any skilled or unskilled manual or clerical work for hire or reward in any industry.

An Industrial dispute—which means a dispute between (*a*) an employer, or Industrial Union of employers, or Industrial Association

Digitized by Google

of employers, and (*b*) an Industrial Union of wokers, or Industrial Association of workers, in relation to industrial matters—may be referred for settlement by an employer or by an Industrial Union (or Association) of workers or employers in the following manner:—

The dispute may be referred to the Board of Conciliation within the Industrial District, or to a Special Board of Conciliators, and if either party is dissatisfied, an appeal may be made thereby to the Court of Arbitration. Or the dispute may be referred by either party direct to the Court of Arbitration, without the intervention of the Board.

An award of the Board is compulsory, subject to an appeal therefrom within one month to the Court; and the award of the Court is compulsory, there being no appeal from its decision.

The recommendations of the Boards and awards of the Court are directed to be drawn up in plain terms, avoiding technicalities as far as possible. It is further provided that "the Court shall, in all matters before it, have full and exclusive jurisdiction to determine the same in such manner in all respects as in equity and good conscience it thinks fit."

The statute, having provided a ready means for the settlement of industrial disputes, introduced as a corollary thereto a new and most important feature, by providing that from the passing of the Act it shall be an offence, punishable by a penalty not exceeding £50, for any person, whether a member of an Industrial Union or not, to take part in, aid, or do anything in the nature of a strike or lock-out.

Nearly all matters under the Act are free of official charge.

Not only is registration of unions and rules under the Act free, but the parties to a dispute are put to no expense when availing themselves of the services of the Boards and Court, other than a nominal fee of 2s. 6d. per case and their own witnesses' expenses. Further, the employment of a shorthand writer to the Court is provided for, the cost thereof being borne by the State.

The following is a statement of the fees to members of the Court and Boards, together with cost of travelling expenses, postages, etc. paid by the Crown during the period (two years and seven months) from the commencement of the 1900 Act, December 1900, to 31st July, 1903:—

	£
Fees to Members of Court	635
Fees to Members of Boards	543
Travelling Expenses, Court and Boards ..	205
Shorthand and Typewriting	548
Postages, Printing, and Advertising, etc., ..	224
Total	£2,155

This statement does not include the cost of administration or the total expense of the holding of the Court and Boards.

Digitized by Google

The extent to which the Act has been recognised by the parties specially interested may be judged from the following table, which presents a summary of the number of industrial unions, etc., registered, and the total membership :—

Industrial Unions, etc., registered, from December, 1900, to 31st July, 1903.

Number of—	Employers.	Workers.
Industrial Unions registered	19	125
" " cancelled	2	7
" " in force on 31st July, 1903 ..	17	118
Industrial Associations registered ..	..	2
Trades and Labour Councils registered	..	2
Total number of members in above bodies on 31st May, 1903	240	14,916

The number of cases of industrial disputes which have been dealt with by the said three Boards and the Court, to the end of July, 1903, are as follows :—

Number of Industrial Disputes dealt with by :	1901.	1902.	1903 (7 months)	Total.
Court of Arbitration	..	65	26	91
Board of Conciliation for the—				
South-West Industrial District ..	4	8	9	21
Eastern Industrial District ..	..	2	1	3
Western Industrial District ..	..	..	..	..
Special Board of Conciliators, Cue ..	..	1	..	1
Total	4	76	36	116

These disputes, which were brought chiefly by the workers, related to demands for increased wages, adjustment of anomalies in the wages sheet, improved conditions of employment, shorter hours of labour, the enforcement of industrial agreements, and the enforcement of awards and orders of the Court and Board.

Trade Unions.

A serious gap in the Statute law of this State was filled when the Governor, on the 19th February, 1902, assented to "An Act to provide for the regulation of Trade Unions."

The Act, which is administered under the Attorney General by the Registrar of Friendly Societies, closely resembles the Imperial

Digitized by Google

Trade Union Statute. It provides for the legal recognition of combinations of employers and workmen which come under the designation of Trade Unions, the registration of Trade Unions composed of seven or more persons, the registration of councils or other bodies to which are affiliated two or more registered Trade Unions, the vesting of property of Trade Unions in trustees, and the registration of such trustees.

It is further provided that the following Acts shall not apply to Trade Unions:—Life Assurance Companies Act, Friendly Societies Act, and Associations Incorporation Act.

A fee of £1 is prescribed on application for registration of a Trade Union.

The rules of an Industrial Union, which is registered under the Industrial Conciliation and Arbitration Act, may, with some few alterations and additions, be registered under the Trade Unions Act.

The number of registered Trade Unions, and of the members therein, are as follows:—

Number on 31st July, 1903, of—	
Registered Trade Unions	52
Members therein	8,897
Total Funds therein	£8,331

It may be noted that nearly the whole of these Trade Unions and their members are included in the statistics of Industrial Unions under the Industrial Conciliation and Arbitration Act, described previously.

Workers' Compensation Act, 1902.

This Act, which is framed on the lines of the Imperial Workmen's Compensation Act of 1897, further extends the liability of employers under the "Employers' Liability Act, 1894," to make compensation for personal injuries suffered by workmen in their employ.

It may be stated that the rights of action which are now available to the worker against his employer, apart from this Act, remain available to him. These rights of action are twofold, namely, an action at common law and an action under the Employers' Liability Act.

A remarkable feature of the Workers' Compensation Act is that a liability is cast upon the employer to pay damages for personal injuries which are not the result of any unlawful act, either of himself or of his servants. In short, the employer who falls within the scope of the Act is made compulsorily the insurer of his servants against injury by accidents arising out of and in the course of the employments within the Act. The only exception to such liability is when an injury is directly attributable to the serious and wilful misconduct of the injured worker.

Digitized by Google

The Act is limited to accidents in certain trades or industries, being for the most part those in which the risks of employment are greater, and consequently in which the accidents are more numerous.

The Act proceeds to limit the compensation, and to provide a summary method for assessing the amount. This latter object is effected by substituting the hearing and determination of a magistrate sitting with two assessors for ordinary litigation. The scale of compensation provided by the Act is—

(*a.*) On death of a worker leaving dependants—£200 to £400, subject to the conditions specified in the Act;

(*b.*) On death of a worker leaving no dependants—an amount not exceeding £100;

(*c.*) During incapacity for work, after second week of such incapacity—an amount not exceeding 50 per cent. of earnings, and not exceeding £2 per week; maximum sum under this benefit to any one worker, £300.

Contracting out of the Act is only allowed where a scheme has been formulated between employers and workers, and has been certified by the Registrar of Friendly Societies as conferring upon the workers benefits not less favourable than those provided by the Act.

The employer cannot evade liability by sub-contracting.

The immediate effect of the passing of the Act has been to cause the employers in all the leading industries affected to take out Accident Insurance Policies for the purpose of indemnification against the whole or a portion of the liability imposed by the Act.

4.—FRIENDLY SOCIETIES AND BUILDING SOCIETIES.

(Supplied by Edgar T. Owen, F.S.S., Registrar of Friendly Societies, Government Actuary, etc.)

FRIENDLY SOCIETIES.

Friendly Societies are, in their nature, altogether distinct from Charitable Institutions, and are not subsidised by the State other than by occasional grants of land for building purposes.

The Friendly Societies established in Western Australia comprise branches of all the leading orders or associations represented in Great Britain and in the other States of the Commonwealth. The branches, lodges, courts, or divisions (as they are variously termed), are in most cases grouped into districts or grand lodges, having a central body situated in Perth, Fremantle, or Kalgoorlie. Each society has a distinctive name and possesses its own peculiar code of

Digitized by Google

laws for the institution and management of the branches, the conduct of the meetings, the conditions of membership, the nature and extent of the benefits afforded, the penalties for breaches of rules, etc.

Parliament has signified its recognition of the useful and important work performed by those voluntary mutual sickness, medical and funeral assurance associations, and the benefits they confer on the community, by passing "The Friendly Societies Act, 1894," which provides for the registration thereunder of all societies and branches which are, or may hereafter be, established for the purpose of carrying out one or more of the objects enumerated below.

Societies and branches may be registered, which provide, in return for voluntary subscriptions and levies paid by the members, or one or more of the following benefits :—

(*a.*) Assuring to a member during sickness a weekly allowance (not exceeding 40s. a week from any two or more branches or societies);

(*b.*) Providing medical attendance and medicine for a member and his family, in accordance with the rules;

(*c.*) Assuring the payment of a funeral allowance on the death of a member and his wife;

(*d.*) The purchase of land and erection of buildings to provide homes for aged or distressed members;

(*e.*) The relief or maintenance of a member in distressed circumstances;

(*f.*) The insurance against fire of the tools of trade of a member.

Societies having other objects of mutual benefit and advantage to the members may, on the certificate of the Attorney General, be registered as "specially authorised societies."

The Act gives Friendly Societies a legal standing. It provides for the protection of their funds and the periodical investigation of their affairs; their scales of contributions must be approved by the Registrar of Friendly Societies, and their rules generally must be in strict conformity with the Act.

Registration under this Act is not, however, compulsory. The rules of the societies and branches established prior to 1895 were confirmed under the Ordinance 27 Vict., No. 6, of 1863; such societies and branches are gradually bringing their rules into full accord with the law now in force.

The 1894 Act requires the appointment of a Registrar of Friendly Societies for the special benefit of such societies, whose duty it is to register each society and branch (after thorough examination and approval of the rules, including the tables of contributions and benefits), to collect annually detailed statistics from each society and

Digitized by Google

branch of its finances and sickness and mortality experience, and generally to administer the Act. The scale of fees payable by the societies for these and other services has purposely been made low in order to encourage the societies, as registered bodies, in the carrying out of their laudable objects.

The several societies registered under the Act at the end of 1901, together with the number of branches and members and amount of funds, are set forth in the following table :—

Registered Friendly Societies at the end of 1901.

Society.	Year when Established.	No. of Registered Branches.	No. of Benefit Members.	Amount of Funds.
				£
Manchester Unity Independent Order of Oddfellows—				
Western Australian District ..	1851	6	571	14,590
Central Goldfields District ..	1900	3	359	685
Murchison District	1900	2	101	578
Albany District	1901	2	193	1,973
Total of M.U.I.O.O.F. ..	..	13	1,224	17,826
Independent Order of Rechabites (W.A. District)	1872	12	597	9,541
Hibernian Australasian Catholic Benefit Society (W.A. District)	1878	10	533	2,889
Order of Sons of Temperance Friendly Society, G.D. of W.A.	1878	7	246	880
Independent Order of Oddfellows	1889	19	1,376	3,086
Ancient Order of Foresters, W.A. District	1891	18	1,689	5,065
United Ancient Order of Druids, D.G. Lodge of W.A. ..	1891	25	1,883	6,227
Protestant Alliance Friendly Society of Australasia, G.C. of W.A.	1892	7	378	2,000
Irish National Foresters' Benefit Society, S.E.C. of W.A. ..	1893	3	232	791
Grand United Order of Oddfellows, W.A. District ..	1895	10	330	668
Australian Natives Association ..	1896	14	1,028	3,249
Grand United Order of Free Gardeners, W.A. District ..	1897	8	403	920
Total, 15 Societies ..	..	146	9,919	53,142

There were in the above-named societies, in 1901, 587 honorary members.

The value of the benefits given during the year was :—

	£
Sick pay	3,935
Funeral money	940
Medical attendance and medicine ..	8,318
Total	£13,193

Digitized by Google

In addition to the friendly societies proper, contained in the above table, the following bodies are registered under the Friendly Societies Act, 1894 :—

Society.	Year when Established.	Amount of Funds.
		£
City Band of Hope and Temperance League	1874	4,052
Kalgoorlie Caledonian Society	1896	647
Friendly Societies Association of Kalgoorlie	1900	393
United Friendly Societies of Boulder ..	1900	1,562
Boulder United Friendly Societies Medical Institute and Dispensary	1900	112
Perth United Friendly Societies Dispensary and Medical Institute	1900	1
Boulder City Caledonian Society ..	1900	269
Friendly Societies Council of W.A. ..	1901	..
Total of specially authorised Societies ..	..	7,036

Building Societies.

Building societies are established in Western Australia under the Ordinance for the Regulation of Benefit Building Societies, 1863 (27 Vict., No. 7), and are regulated by it and the Friendly Societies Ordinance (27 Vict., No. 6), which is retained in force for that purpose only.

Matters connected with such institutions are dealt with in the office of the Registrar of Friendly Societies.

The following is a complete list of the Building Societies so established as at the 31st December, 1902, the Rules of which have been duly confirmed by His Excellency the Governor in Council :—

Name of Society.	Year when Established.	Where situated.
Perth Benefit Building, Investment, and Loan Society, Permanent	1862	Perth
Fremantle Benefit Building and Investment Society	1875	Fremantle
Northam Mutual Benefit Building, Investment, and Loan Society, Permanent	1889	Northam
Albany Benefit Building, Investment, and Loan Society, Permanent	1889	Albany
Geraldton Benefit Building, Investment, and Loan Society, Permanent	1890	Geraldton
Bunbury Benefit Building, Investment, and Loan Society, Permanent	1892	Bunbury.
Western Starr-Bowkett Building Society	1892	Perth
Swan District Benefit Building, Investment, and Loan Society, Permanent	1895	Guildford.
West Australian Building Society, Permanent ..	1898	Perth
Perth Co-operative Starr-Bowkett Society, No. 1 ..	1899	Perth.
Commonwealth Land, Building, and Investment Society	1902	Fremantle.
Metropolitan Starr-Bowkett Society, No. 2 ..	1902	Perth.

Digitized by Google

5.—ASSOCIATIONS, HALLS, AND INSTITUTES.

Agricultural and Horticultural Associations, etc.

At the close of the year 1901 there were in the State 65 Associations and Societies of Agriculturists, Horticulturists, Wine and Fruitgrowers, and Pastoralists, with a total, so far as recorded, of about 2,000 members. Horticulture was included among the objects of at least 10 of these; fruitgrowing was only specified in five of the names, vine growing in two, and the pastoral industry in three. The total receipts during the year amounted to about £6,000; of this sum the Government contributed nearly £900, the balance being mostly made up from membership fees, donations, and receipts from shows. Thirty Agricultural and Industrial Shows were held in various parts of the State. The Royal Agricultural Society, founded in 1831, had a roll of 218 members. This society has a large, well-arranged show ground at Guildford, but its new show ground is being laid out in much more conveniently situated grounds at Claremont, about half way between Perth and Fremantle, and in close proximity to the railway. The annual shows are popular and well supported.

The number of these Associations and Societies, at the end of 1902, had increased to 81; the following being a complete list of those known to the Agricultural Department:—Albany Agricultural and Horticultural Society, Albany and District Settlers' Association, Albany and King River Settlers' Association, Armadale Progress Association, Balingup Farmers' Association, Beverley Agricultural Society, Boulder City Dog and Poultry Society, Boyanup Farmers' and Progress Association, Boyup Brook Agricultural and Vigilance Committee, Brunswick Farmers' Association, Capel Farmers' Association, Chapman Farmers' Association, Coogee Agricultural and Horticultural Society, Cookernup Farmers' Progress Association, Coolup Progress Society, Darling Range Vine and Fruitgrowers' Association, Deepdale Farmers and Fruitgrowers' Association, Drakesbrook Agricultural Association, Esperance Agricultural, Horticultural, and Floricultural Society, Ferguson Farmers' Progress Association, Fremantle Dog and Poultry Society, Fremantle Horticultural Society, Geraldton Agricultural and Horticultural Society, Gingin Poultry Society, Goldfields Dog, Poultry, and Horticultural Society, Goomalling Farmers' Association, Great Southern Pastoral and Agricultural Districts Society, Greenhills Farmers' Club, Greenough Farmers' Association, Greenough Farmers' Club, Harvey Agricultural Alliance, Harvey Farmers' Club, Irwin Districts Agricultural Society, Jandakot Agricultural Society, Jarrahdale and Serpentine Agricultural Society, Jennapullen Agricultural Society, Jurakine Agricultural Society, Kalgoorlie Dog and Poultry Society, Kelmscott and Armadale Agricultural Society, Kojonup Agricultural Society, Lower Blackwood Farmers and Graziers' Association, Mandurah Progress and Agricultural Association, Marbellup and District Settlers' Association, Moora Farmers' Progress Association, Mount Barker Rural Association,

Digitized by Google

Murray Farmers and Fruitgrowers' Co-operative Association, Murray Horticultural Society, Narrogin-Cuballing Agricultural Alliance, Nelson Agricultural Society, Newcastle Branch Bureau, Newtown Progress Association, Northam Agricultural Society, Northam Poultry and Dog Society, Pingelly-Mourambine Agricultural Society, Pinjarra Dog and Poultry Society, Quindalup Progress Association, Royal Agricultural Society of W.A., Southern Districts Agricultural Society, South-West Central Agricultural and Horticultural Society, Thomson's Brook Progress Association, Toodyay Agricultural Society, Toodyay Vine and Fruitgrowers' Association, Upper Blackwood Vigilance Committee and Agricultural Society, Upper Chapman Farmers and Fruitgrowers' Association, Upper Preston Progress Association, Victoria Plains Farmers' Association, Wagin-Arthur Districts Agricultural, Horticultural, and Industrial Society, Waigerup Agricultural Hall Association. Walliabup Progress and Horticultural Association, Wandering Districts Agricultural Society, Wanneroo Farmers and Gardeners' Association, Waterloo Farmers and Vine and Fruitgrowers' Association, Wellington Agricultural and Pastoral Society, West Australian Poultry and Doy Society, W.A. Beekeepers' Association, West Coolup Farmers' Association, West Swan Producers' Association, Williams Agricultural Society, Wongamine Farmers' Club, Wonnerup Progress Association, York Agricultural Society.

Agricultural Halls

At the end of the year 1902, 65 Agricultural Halls were recorded as being erected throughout the agricultural districts, at the following places :—

Arthur River
Balbarup
Balingup
Belmont
Beverley, East
Blackwood, Lower
Blackwood, Upper
Boyanup
Brunswick
Cannington
Capel
Carrolup
Chittering
Coogee
Cookernup
Coolup
Cuballing
Culham
Dardanup
Donnybrook
Drakesbrook
Gingin Brook
Goomalling
Gooseberry Hill
Grass Valley
Greenhills
Harvey
Jandakot
Jandakot, West
Jennapullen
Jurakine
Karridale
Kellerberrin
King River
Kojonup
Mandurah
Meckering
Mingenew
Moora
Mooradung
Moordiarup
Mount Barker
Moorambine
Mumberkine
Mundaring
Mundijong
Narrogin
Newtown
Nunyle
Pingelly
Preston
Quellington
Quindalup
Rockingham
Smith's Mill
Wagin
Waigerup
Walkaway
Wandering
Waterloo
Wedgcarrup
Williams
Wongamine
Wonnerup
Woodanilling

Digitized by Google

For the year 1901, returns from most of the 61 of those then existing were received by the Government Statistician. The total cost of the buildings up to that date, so far as known, was between £21,000 and £22,000; and towards this amount the Government had contributed considerably over £15,000.

These halls are used for meetings of agricultural and other societies, and when convenient, for social purposes. Many of the halls have, in addition, small libraries, and consequently are a valuable adjunct to rural life, both from an educational and social standpoint. Annual Government grants are given wherever the circumstances warrant this course.

Literary Societies and Institutions.

In Perth and other towns there are Literary Societies and Libraries in connection with most of the Churches, and also the Young Men's Christian Association. Besides these, the Swan River Mechanics' Institute—the oldest institution of the kind in the State—has of late years constructed, at a cost of over £11,000, a fine building, containing a large concert hall, lodge room, library, reading rooms, billiard room, and offices. It has a fine selection of books, and many of the best Colonial, English, and Foreign periodicals and newspapers are kept on file in the reading rooms.

The West Australian Railway Institute was founded in September, 1897. Its objects are the diffusion of literary, scientific, and useful knowledge relating to railways, by means of lectures, addresses, literature, debates, etc. The library already contains over 700 volumes. The institute is located in Wellington Street, Perth.

At the close of the year 1902, 49 Mechanics' and Literary Institutes were recorded as existing in the State, as follows:—

Albany
Armadale
Beverley
Boulder
Bridgetown
Broad Arrow
Broomehill
Bunbury
Busselton (Weld Institute)
Busselton (Working Men's Association)
Collie
Coolgardie
Cottesloe
Derby
Dongara
Esperance
Field's Find
Fremantle
Fremantle, North
Gascoyne (Jubilee Library)
Geraldton
Gingin
Greenbushes, North
Greenough (St. Catherine's Hall)
Guildford
Helena Vale
Katanning
Kunanalling
Lennonville
Malcolm
Menzies
Newcastle
Norseman
Northam
Northam (Railway Institute)
Northampton
Paddington
Perth (Railway Institute)
Pinjarra
Roebourne
Rottnest
Shark Bay
South Perth
Southern Cross
Subiaco
Swan River
Wagin
Wyndham
York

Digitized by Google

Returns for 1901 were received from 37 of the 47 Institutes then existing. The cost of buildings to the end of 1901 amounted to more than £35,000. Special awards towards construction were made by the Government, amounting to considerably over £10,000. Most of the Institutes receive a small annual grant from the Government towards their upkeep. They are usually well supplied with the best class of books and newspapers. Members who wish to make use of the circulating libraries in connection with the institutes pay an additional small yearly subscription; but, in most of them, all visitors are allowed free use of the periodical literature.

MINERS' INSTITUTES.

Forty Miners' Institutes were reported to exist on the various "fields" of the State at the end of 1902, as follows:—

Austin Island	Lawlers
Balagundi	Leonora
Bardoc	Marble Bar
Black Flag	Mount Jackson
Bonnie Vale	Mount Magnet
Boogardie	Mount Sir Samuel
Bulong	Morning Star
Cuddingwarra	Mulgarrie
Cue	Mulline
Cue (Workers' Hall)	Nannine
Day Dawn	Niagara
Goongarrie	Nullagine
Greenbushes	Paddington (Workers' Hall)
Kalgoorlie	Peak Hill
Kalgoorlie (Trades' Hall)	Sons of Gwalia
Kanowna	Waverley (Siberia)
Kanowna (Workers' Hall)	Weeloona
Kimberley Goldfields	W.A. Chamber of Mines
Kookynie	Yalgoo
Kurnalpi	

Reports for 1901 were received from 31 of the 39 then existing. The total cost of buildings up to the date under review was over £24,000. of which amount more than £11,000 was donated by the Government. Most of the institutes had libraries, and were well supplied with periodicals and newspapers.

6.—CHARITABLE INSTITUTIONS, ETC.

(Information supplied by James Longmore, Superintendent of Public Charities.)

HOMES FOR THE AGED.—There are two institutions in Perth, maintained by the State, for the housing of the poor. The Old Men's Home, Mount Eliza, for old and infirm men, had on the 31st December, 1902, 279 inmates; the Old Women's Home, 72. The Old Men's Home, Fremantle, for old and infirm men had, on the 31st December, 1902, 85 inmates.

Digitized by Google

OUTDOOR RELIEF.—Relief is given to destitute persons throughout the State, in the shape of rations and monetary assistance. The total number who received rations and money during 1902 was 819 adults and 480 children; total 1299. The expenditure incurred on account of rations and monetary assistance amounted to £4,036 12s. 3d.

INDUSTRIAL SCHOOLS.—There are now nine institutions established in this State for the reception, maintenance, and training of destitute, neglected, or convicted boys and girls. These institutions are under the supervision of the Inspector of Industrial and Reformatory Schools.

Government Industrial School and Receiving Depôt for Boys and Girls, Subiaco (*established* 1894).—There were 39 boys and 26 girls resident in this institution on the 31st December, 1902, against 31 boys and 10 girls for the previous year. The principal industries taught are: bootmaking and repairing, carpentry, picture framing, painting and glazing. Beekeeping and poultry raising were very successfully carried on during the year. The Government allowance for 1902 was £1,695 19s. 2d.

Orphanage Industrial School for Roman Catholic Girls, near Subiaco.—This institution, which was established at Perth in 1868, was removed in November, 1901, to the buildings at Subiaco, then recently vacated by the Roman Catholic boys. There were 76 inmates on the 31st December, 1902, being two less than for the previous year. The girls are taught baking, cooking, laundry work, typewriting, domestic duties, and the making and mending of their clothes. The Government allowance for 1902 was £1,569 10s. 8d.

Orphanage Industrial School for Junior Protestant Girls, Adelaide Terrace, Perth (*established* 1868).—There were 57 inmates on the 31st December, 1902, being eight more than for the previous year. The girls receive instruction in cooking, laundry work, needlework, and dressmaking. Several are taught to milk. The Government allowance for 1902 was £1,093 3s.

Swan Orphanage Industrial School for Junior Protestant Boys, near Guildford (*established* 1871).—There were 69 inmates on the 31st December, 1902, being same total as previous year. The principal industries carried on are: carpentry, bootmaking, beekeeping, and tailoring, while the farm, some three miles from the institution, provides an excellent training in farm work for the elder inmates. The Government allowance for 1902 was £1,482 14s. 9d.

St. Kevin's Orphanage Industrial School for Senior Roman Catholic Boys, Glendalough, near Leederville (*established* 1897).—There were 44 inmates on the 31st December, 1902, being a decrease of five on the previous year. The industries carried on are: carpen-

Digitized by Google

try, tailoring, shoemaking, gardening, farming, and baking. The Government allowance for 1902 was £1,100 3s. 3d.

Clontarf Orphanage Industrial School for Junior Roman Catholic Boys, near Victoria Park.—This institution, which was established at Subiaco in 1872, was removed in September, 1901, to the new institution then recently erected at Clontarf, on the Canning River. The new building is a magnificent one, and has cost about £10,000. There were 70 inmates on the 31st December, 1902—being same total as previous year. The work principally carried on is farming, gardening, carpentry, baking, butchering, and cooking. The Government allowance for 1902 was £1,444 3s. 1d.

Salvation Army Industrial Schools for Boys and Girls, Collie.—These institutions were opened on the 27th September, 1901. The main building is situated on the bank of the Collie River. The settlement comprises over 20,000 acres, and already there is a large amount of stock. All buildings and appliances requisite for giving the inmates a thorough practical farm training have been erected. The girls are taught sewing, laundry work, and domestic duties. There were 46 boys and 19 girls resident in the three institutions on 31st December, 1902, being an increase of 21 boys and 9 girls over the total for the previous year. The Government allowance for 1902 was £1,404 13s. 10d.

Rottnest Reformatory for Boys (*established* 1881).—This institution, which had been in existence for 20 years, and done excellent work, was closed on the 27th September, 1901, the inmates, 14 in number, being transferred to the Salvation Army Institution at the Collie.

The actual amount contributed by the Government for the maintenance of children in all Industrial Schools during 1902 was £9,790, being an increase of £558 on the previous year.

LABOUR BUREAU.—The Government Labour Bureau, which was opened in 1898, is conducted by the Superintendent of Public Charities. It is run on business lines, its object being to find work for those in search of it, and to bring the employer of labour and the employee together, without cost to either party. Each year shows a substantial increase in the number of applicants. The number of individual men who registered for work during the year 1902 was 4,694, an increase of 2,044 from the previous year. Employment was found for 1,805 persons during the year 1901, an increase of 693 for the year. Quarterly returns are prepared, showing the condition of the labour market throughout the State; copies of the returns are forwarded to the Agent-General in London, also to the "Labour Gazette," and in these periodicals extracts of the returns are published from time to time.

Digitized by Google

NATIVE INSTITUTIONS.—The *New Norcia Mission* receives an annual grant from the Government towards the support of the Mission. The number of inmates on the 31st December, 1901, was 154 ; being 72 males and 82 females.

There were, on the 31st December, 1901, 47 aboriginal and half-caste children (18 boys and 29 girls) at the *Swan Anglican Native Institution*, towards the support and education of whom the Church of England receives a grant of 1s. *per capita* per day.

These grants are paid through the Protector of Aborigines.

Over £2,000 has been raised, a piece of ground has been secured in a favourable location. and plans have been adopted for the erection of a Children's Hospital in Perth.

There is an INSTITUTION FOR THE EDUCATION OF THE BLIND at Maylands, a suburb of Perth. The building can accommodate 26 inmates. Here the children receive a common school education, and the adults are taught useful trades. The institution is supported by public subscriptions and a Government subsidy.

A DEAF AND DUMB INSTITUTION for the maintenance, education, industrial training, and advancement in life of deaf and dumb children was founded in 1896. The Government granted the committee the fee simple of four acres of land at Cottesloe, where, at a cost of about £1,800, a building has been erected affording accommodation for 24 inmates.

OTHER INSTITUTIONS.—In addition to the institutions enumerated, there is a "Home of Peace" in Perth, a "Convalescent Home" at Cottesloe, also, at the latter place, a "Cottage by the Sea," founded by Lady Lawley for young people, and various other charitable institutions maintained by private subscriptions.

LUNATIC ASYLUMS.—There are two Government Lunatic Asylums—one at Fremantle, and another at Whitby Falls. The inmates in the former, on the 31st December, 1901, numbered 294, or 192 males and 102 females; 249 of the total number being considered incurable. At Whitby Falls, where males only were admitted, the number of inmates on the above date was 48, comprising 46 incurables. The total number of lunatics maintained in the asylums on the same date of the previous year was 277.

HOSPITALS.—There are Government Hospitals at the following places:—Albany, Bridgetown, Broome, Bunbury, Carnarvon, Collie, Coolgardie, Cue, Derby, Geraldton, Guildford, Kalgoorlie, Katanning, Kookynie, Lawlers, Marble Bar, Menzies, Newcastle, Northam, Onslow, Pinjarra, Roebourne, Southern Cross, Williams, Wyndham, and York. All these are wholly supported by Government funds. In addition there are "assisted" hospitals at Broad Arrow, Bulong,

Kanowna, Lake Way, Laverton, Leonora, Mount Magnet, Mount Morgans, Mulwarrie, Nannine, Norseman, Peak Hill, and Ravensthorpe. These hospitals are subsidised by the Government in the following manner: a £ for £ subsidy is paid on all donations, subscriptions, and net proceeds of entertainments: 25s. per week is paid for indigent patients; and £100 per year is paid towards the medical officer's salary at all the hospitals except Broad Arrow and Nannine, where the medical officers receive £200 and £150 respectively. Finally, there are public hospitals in Perth and Fremantle, both managed by Committees under special Act of Parliament, and mainly supported by Government.

An estimate of the work done during the year ended 30th June, 1901, by each of the hospitals then existing, may be made from the figures given below:—

Locality.	Indoor Relief.					Outdoor Relief.
	Total Cases Treated.			Average daily number resident.	Average residence during the year of persons treated.	Number of Patients.
	M.	F.	Total.			
	No.	No.	No.	No.	Days.	No.
Albany	113	18	131	10·22	28·48	..
Bridgetown	17	7	24	1·07	16·33	..
Bunbury	221	86	307	18·03	21·44	354
Busselton	16	1	17	0·81	17·35	16
Carnarvon	33	2	35	1·55	16·11	..
Coolgardie	520	145	665	36·55	20·06	1,581
Cue	156	29	185	12·90	25·45	†
Derby	15	..	15	0·94	22·93	†
Fremantle	447	189	636	41·82	24·00	850
Geraldton	148	37	185	12·16	23·98	340
Guildford	147	23	170	7·50	16·11	117
Kalgoorlie	748	172	920	64·58	25·62	4,633
Katanning	28	6	34	1·96	21·00	7
Marble Bar	48	..	48	2·84	21·56	..
Menzies	131	24	155	7·28	17·14	20
Newcastle	11	..	11	0·41	13·73	..
Northam	146	30	176	10·48	21·73	77
Perth	925	435	1,360	102·09	27·40	2,651
Pinjarra	11	11	22	0·61	10·09	25
Roebourne	41	2	43	1·81	15·40	..
Southern Cross ..	124	31	155	8·19	19·28	†
Williams	11	..	11	0·55	18·09	†
Wyndham	14	..	14	0·45	11·86	54
York	53	18	71	3·08	15·83	360
Total	4,124	1,266	5,390	347·88	23·56	‡

† No information available. ‡ Incomplete.

The comparison with previous years, which is attempted in the following table, is not in every way reliable, as the figures for some of those years, notably for 1897, are not altogether complete. The particulars relate to the total number of cases treated in all hospitals

Digitized by Google

during each year, the total number of deaths that occurred, and the percentage of the latter number to that of the cases treated :—

Cases and Deaths.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	Half-year ended 30th June, 1899.	Year ended 30th June, 1900.	Year ended 30th June, 1901.
Cases	852	778	873	2,363	4,135	4,635	7,320	3,170	5,275	5,390
Deaths	98	83	89	240	408	386	536	236	401	474
Percentage Deaths to Cases ..	11·50	10·67	10·19	10·16	9·87	8·33	7·32	7·44	7·60	8·79

7.—LAW, CRIME, ETC.

"It is well to bear in mind that crime arises largely from the *want* of something, a want probably easily and economically met in childhood; for it is usually a want of education, of a trade, a home, want of moral control, or even want of food, resulting in physical degeneracy." These words of Miss Rosa M. Barrett's, in a lecture delivered before the Royal Statistical Society on the 20th March, 1900, on "The Treatment of Juvenile Offenders," would easily lead us to expect that in a State like Western Australia, where the pinch of want is so much less keen than among the crowded populations of the older countries, crime ought to exist in smaller proportions than elsewhere. Yet such expectation is not borne out by experience. On the contrary, an investigation of the Criminal Statistics of this State proves that a larger percentage of its population infringes the laws than in countries less favourably circumstanced. A glance at the nature of that population will, however, readily explain this seeming contradiction. Constituted altogether differently to most other populations, that of Western Australia, owing to its phenomenal increase by immigration during the past decade, presents an entirely disproportionate preponderance of males over females, and of adults over juveniles. This fact in itself would probably suffice to account for the greater proportion of the criminal element in its population—for in all countries crime is naturally most prevalent amongst male adults—but in addition, it cannot be denied that the rapid growth of our goldfields attracted, and still continues to attract, not only the legitimate miner, but also a very large number of his natural parasites—the spieler, the loafer, and the other usual outcasts of society. As the late Commissioner of Police, Lieutenant-Colonel G. B. Phillips, stated in his report for the year ended 30th June, 1898, "The increase in more serious offences must be attributed to the continued influx from other colonies

old offenders, who have acquired a high degree of skill and cunning in planning and perpetrating crimes with a minimum risk of detection."

It is, of course, difficult to draw an exact parallel between two States as regards the comparative proportions of the crime therein committed, as the annual results shown by the Criminal Statistics depend so largely on the Statutes under which, and the persons by whom, the administration of justice is carried out. The number, for instance, of charges during a certain year may vary according to circumstances quite distinct from the actual amount of crime committed, such as the greater or less exertion on the part of the police, the more or less scattered condition of the population, and numerous other causes. Nor does it convey much meaning without a knowledge of the number of commitments and convictions, and an analysis of the nature of the crimes. Again, the number of convictions includes so many offences that can hardly be looked upon as crime in its more serious sense—such as breaches of municipal and other regulations, disorderly conduct, and other punishable actions—that it may be safely asserted that comparisons between different countries are scarcely likely to lead to instructive results, unless only the more serious classes of offence are mutually compared; and even if this be done, the exceptional circumstances of Western Australia make any comparison in her case more or less futile. A very fair estimate of the fluctuation of crime, during that period when the State made its most rapid growth, may, however, be obtained from the annual statistics compiled in the Police Department. The figures furnished direct to the Government Statistician by the various Criminal Courts only relate to recent years, and can therefore not be used for any other purpose than that of comparing the numbers of cases in the separate districts. The totals of these returns differ somewhat from those supplied by the police, probably owing to different methods being employed in classifying the cases.

Card System employed for collecting Statistics.

Recently a new system of collecting the crime statistics has been introduced by the Statistical Department, in conjunction with and with the co-operation of the Police and Prison Departments, and it is anticipated that the information obtained for 1903 and future years will be of a more valuable and comprehensive nature than that hitherto available. Under the present system, cards are supplied every month direct to the Government Statistician from every police station, containing full particulars of every case brought before a magistrate, whether resulting in a conviction or not. In addition, every police station or prison furnishes the Statistical Office, weekly, with a return of all the prisoners released, transferred, or otherwise removed, thus supplying a continuous record of the fluctuations of the criminal population, which record, at the end of the year, is checked

Digitized by Google

by a succinct census of all persons then present in custody at each gaol and police station. The information embodied on the criminal charge cards gives the name, alias, charge, sentence, conjugal state, education, age, nationality or race, religion, trade, and other special particulars, if necessary, concerning the person charged; so that by means of these cards the annual criminal records can be readily tabulated.

Offences, Commitments, etc.

While the mean population of the State between the years 1893 and 1902 increased rapidly from 61,690 to 207,142, the total number of offences reported to the police or magistrates, in comparison, rose very gradually, the figures for the two above-named years being 7,115 and 18,524 respectively. The following table, whilst giving an analysis of the offences reported, distinguishes the various classes of crime represented, and their proportion.

Number of offences reported to the police or magistrates during each of the ten years, 1893–1902.

Year.	Offences against the Person.	Prædial Larceny.	Offences against Property (other than Prædial Larceny).	Offences against Currency.	Other Offences.	Total Number of Offences Reported.	Percentage of Mean Population.
1893	717	25	1,338	12	5,023	7,115	11·53
1894	742	14	1,651	24	6,330	8,761	11·67
1895	971	10	1,341	13	6,735	* 9,070	* 10·06
1896	1,187	35	2,270	35	10,850	14,377	11·72
1897	1,343	21	4,463	37	12,559	18,423	11·84
1898	1,196	27	2,799	36	12,229	16,287	9·64
1899	1,087	17	2,494	46	11,425	15,069	8·94
1900	1,092	36	2,968	26	12,102	16,224	9·16
1901	1,116	24	3,391	41	12,808	17,380	9·22
1902	885	40	3,771	21	13,807	18,524	8·94

* Including doubtful and fictitious cases.

It will be seen that in every year the "other offences" form the lion's share of the total; the proportion both in 1893 and in 1902 being over 70 per cent. The nature of these "other offences" has already been referred to as being, in the majority of cases, more that of breaches of minor regulations for the maintenance of good order than that of actual crime. The annual balance of the offences—comprising "offences against the person," "prædial larceny," "offences against property other than prædial larceny," and "offences against currency"—appears, therefore, to be, *as a rule, little* more than one-fourth of the total, but

in 1897 the offences against the person and against property rose above their normal proportion. This was probably owing to the greater activity of certain criminals, indicated by the Commissioner of Police in the report already quoted, especially as no corresponding rise is noticeable in the increase of persons charged. The offences against property, which considerably out-distance the remaining ones, are followed by those against the person; and it will be noticed that the most rapid increase during the decade is to be found in those of the former class.

For the earlier years (1893 to 1897, both inclusive), the "offences reported" included a certain number of doubtful and fictitious cases which, since the year 1898, have been carefully eliminated. This wrongful addition to the earlier figures, and also the fact that offences committed by aborigines are necessarily also included, make the comparison, for the respective years, with the mean population of the State (from which all aborigines are excluded) more or less unprofitable.

A better opportunity of gauging the proportion of crime to the mean recognised population, during each of the ten years, is afforded by the following statement relating to the number of separate charges disposed of and the number of persons charged, as here the aborigines are distinguished from the other criminals.

Year.	Mean Population.	Number of Separate Charges disposed of.				Number of Persons Charged.				
		Males.	Females.	Males and Females.	Aborigines.	Males.	Females.	Males and Females.	Male Aborigines.	Female Aborigines.
1893	61,690	5,074	443	5,517	771	3,269	243	3,512	547	24
1894	75,055	5,985	531	6,516	636	5,172	438	5,610	561	42
1895	90,148	7,270	556	7,826	551	6,089	425	6,514	482	45
1896	122,696	12,193	580	12,773	545	9,384	468	9,852	424	44
1897	155,563	13,883	907	14,790	643	10,522	596	11,118	536	54
1898	168,999	13,333	962	14,295	607	10,966	686	11,652	456	60
1899	168,528	12,406	983	13,389	491	9,543	757	10,300	419	32
1900	177,073	13,203	1,147	14,350	513	10,200	782	10,982	430	49
1901	188,603	13,629	1,183	14,812	521	10,678	776	11,454	426	32
1902	207,142	14,596	1,333	15,929	514	11,348	896	12,244	405	27

The number of aboriginal criminals has fluctuated somewhat during the ten years under review, but has, on the whole, exhibited a marked tendency to decrease, falling from 771 in 1893 to 514 in 1902.

In view of the fact that the recent extension of settlement has probably increased the number of natives brought into immediate contact with civilisation, this state of things cannot be regarded as other than satisfactory.

Digitized by Google

The other totals afford fairly reliable material for a comparison with the mean population; the percentages are:

Percentage to Mean Population of:	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
Charges ..	8·94	8·68	8·68	10·41	9·51	8·46	7·94	8·10	7·85	7·69
Persons ..	5·69	7·47	7·23	8·03	7·15	6·90	6·11	6·20	6·07	5·91

The phenomenal growth of crime during the two years, 1896 and 1897, is strikingly evidenced by these figures; as although the mean population on each occasion attained an annual increase of more than 30,000 persons, yet the number of criminal charges and of persons criminally charged rose in a still higher proportion. It is a somewhat grave reflection on the moral condition of the community that on the average every 100 inhabitants living in the State during the year 1896 were responsible for more than ten criminal charges. And even at its lowest, in 1902, when the figures were 7·69, the proportion appears a very high one. The reason, however, for this high rate of crime is, as it has already been stated, traceable to the great preponderance of adult males in the constitution of the population, and it is not to be expected that any material change will be effected in this respect so long as the State continues to attract so large a number of adventurous immigrants. The later years certainly show a gradual, if only a slight, improvement under both headings.

Summary Convictions.—Taking next the Summary Convictions in the Magistrates' Courts, the following table shows the record for each class of offences during the decade 1893-1902:

Year.	Offences against the Person.	Prædial Larceny.	Other Offences against Property.	Offences against Currency.	Offences against Masters and Servants Act.	Drunkenness.	Other Offences.	Total Convictions.
1893	292	6	557	..	234	721	2,258	4,068
1894	309	7	556	3	243	798	2,487	4,403
1895	365	10	596	..	233	1,208	2,897	5,309
1896	621	17	824	2	395	1,825	4,742	8,426
1897	601	17	993	4	604	1,842	5,523	9,584
1898	631	9	1,074	..	822	1,630	5,493	9,659
1899	615	4	941	2	503	1,595	5,633	9,293
1900	568	18	999	..	378	1,740	6,222	9,925
1901	630	9	968	1	495	2,052	6,674	10,829
1902	406	21	1,032	..	303	2,066	7,708	11,536

These figures, of course, require to be supplemented, first by the convictions following those cases which were committed for trial in the superior Courts, and secondly by the large number of cases, mostly of drunkenness, in which the persons convicted were only cautioned, or discharged as first offenders, no penalty being inflicted. The cautioned offenders and discharged first offenders, in 1893, numbered no less than 933, and amounted in 1902 to 1,913, and of these

numbers "drunkenness" was responsible for 593 and 1,217 respectively. It must, on the, other hand, be remembered that the figures include all crime committed by aborigines, which, unfortunately, was not in every case separately tabulated during those years, an omission which it will now be possible to remedy under the present system of collecting crime statistics.

It has already been remarked that the lesser forms of crime, as previously generalised under the heading of "other offences," constitute by far the greater portion of the cases annually dealt with, and it will, from the table now under review, be further noticed that a very considerable number of these offences come under the heading "drunkenness"; whilst, in addition, many others are, according to the annual reports of the Commissioner of Police, directly attributable to the results of drink; as, for instance, out of the 7,708 "other offences" recorded for the year 1902, he calculates the number of such cases at 3,453.

That the proportions of female criminals and aborigines included in the total convictions is not large will be seen from the following figures for the six years, 1897–1902.

Convictions of:	1897.	1898.	1899.	1900.	1901.	1902.
Males	8,563	8,665	8,288	8,777	9,567	10,263
Females	579	577	656	774	885	941
Aborigines	442	417	349	374	377	332
Total	9,584	9,659	9,293	9,925	10,829	11,536

Indictments and Informations in the Superior Courts.—These mainly relate to the more serious forms of crime, as will be at once recognised from the classification hereunder, for the decennial period of the convictions resulting from them:

Year.	Murder.	Manslaughter.	Rape.	Other Offences against Person.	Larceny.	Larceny in Dwelling.	Other Offences against Property.	Forgery and Uttering.	Miscellaneous Offences.	Total Convictions.	Total Number of Cases tried.
1893	2	3	..	25	7	3	14	2	4	60	106
1894	8	2	..	19	6	5	36	7	1	84	132
1895	5		..	13	5	12	15	4	4	59	104
1896		12	..	43	26	7	68	8	2	177	246
1897	9	6	3	36	30	5	83	16	6	194	288
1898	2	5	..	28	32	2	57	23	5	154	292
1899	4	5	2	14	7	8	41	32	3	116	216
1900	11	3	1	22	13	2	61	12	31	156	277
1901	5	6	2	36	19	4	64	16	10	162	245
1902	8	2	1	43	25	..	76	4	6	165	285

Digitized by Google

The number of convictions did not comprise, as a rule, more than about two-thirds of the cases tried, and sometimes hardly one-half. The increase in both totals was distinctly favourable as compared with that of the mean population. The proportion of females and aborigines was invariably small. The largest number of the former tried in one year was 13, in 1900, out of a total of 256 cases, and even then only six were convicted. Of the latter, the largest number tried in any one year previous to 1902 was 20, in 1896, out of a total of 224 cases, and no less than 19 convictions resulted.

The 42 aborigines tried in 1902, of whom 33 were convicted, are mostly accounted for by the fact that numerous offenders in the far North were, during that year, committed for trial for offences that in other years had been dealt with summarily.

The indictable offences against the person were most numerous in the year 1896, whilst those against property reached their high-water mark in 1897.

Punishments Inflicted.—With regard to the punishments inflicted on summary conviction, the following table shows that in the large majority of cases the imposition of a fine was deemed sufficient :—

Year.	Fined.	Imprisoned.	Whipped.	Bound Over, with or without Sureties.	Total.
1893	2,491	1,469	91	17	4,068
1894	2,837	1,435	111	20	4,403
1895	3,646	1,573	62	28	5,309
1896	6,224	2,083	83	36	8,426
1897	6,953	2,531	41	59	9,584
1898	7,295	2,297	13	54	9,659
1899	7,043	2,145	19	86	9,293
1900	7,412	2,419	10	84	9,925
1901	8,459	2,287	21	62	10,829
1902	9,195	2,206*	30	105	11,536

* Including 194 detained in Reformatory, etc.

It is remarkable that the number of fines inflicted increased more rapidly than did the population, whilst the number of cases of imprisonment lagged some way behind. The whippings decreased, and the number of persons "bound over" rose from 17 to 105. These facts seem to point to a tendency on the part of magistrates to substitute, wherever possible, the more lenient modes of punishment in place of the harsher.

The manner in which convictions in the Superior Courts were disposed of during the past nine years is shown by the following figures :—

Punishments.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
Fine	1	..	..	..	2	1	..	1	..
Imprisonment ..	59	42	126	145	119	97	122	124	144
Penal servitude ..	13	12	31	27	24	6	13	8	..
Sentence of death ..	8	5	11	11	2	4	12	6	6
Whipping	..	..	..	1	..	..	..	..	..
Discharge on probation	3	..	9	10	7	8	9	22	7
Totals ..	84	59	177	194	154	116	156	162	

Digitized by Google

Here it is evident that the large majority of cases were met by terms of imprisonment, as were also a fair number by sentences to penal servitude. The latter mode of punishment was, however, abolished by the passing of the Criminal Code of 1902.

Drunkenness.—The number of charges of drunkenness, and the number of convictions resulting from them, are both, it is satisfactory to note in reviewing the figures for the past decade, not increasing in proportion to the increase in the population.

This improvement is, no doubt, due to the increased feminine and home influence at present being brought about by the arrival of wives and families from the Eastern States, as also by the consequent increase in the proportion of the female and juvenile population to the population as a whole.

It will be interesting to compare the figures for male adults only; and this will in future be possible, as the newly-adopted system of compiling the crime statistics will render the necessary particulars available. A remarkable feature as regards the offence of drunkenness is the enormous increase observable in the year 1896, which year has already been mentioned as having provided a specially bountiful harvest of crime. In the subsequent years, 1898 and 1899, when the population became more settled, and the beneficial results of family life made themselves more apparent, a considerable falling off once more occurred, and the convictions for drunkenness diminished from 1842 in 1897, to 1,630 in 1898, and to 1,595 in 1899. Proportionately with the increase in population they rose to 1,740 in 1900, and to 2,052 in 1901, whilst in 1902 they remained fairly stationary at 2,066. Their proportion to the mean population at present is, as already indicated, distinctly lower than in the previous years of the decade. Among the large number of offences that are partly or wholly due to intemperance, by far the greatest proportion come under the heading "disorderly conduct," the number for 1902 being 1,272 out of a total of 3,453. "Using obscene or indecent language" was the charge in 771 cases during that year. Next came "common assault," with 216 cases; "resisting or obstructing the police" followed with 153 cases, whilst the use of "abusive, insulting, threatening, or profane language" was responsible for 135 cases. The totals in the other classes of offences attributable to drink were inconsiderable, but embraced crimes of most widely varying natures, including even murder.

Lunacy resulting from drink.—One class of charges which accounts for 77 cases attributable to drink, and which requires special mention, is that of "lunacy." These charges, although magistrates are called upon to give a decision on them, should certainly not be classified under the head of "crime," and the crime

Digitized by Google

record would be naturally reduced if they were excluded from the tables. In 1902, for instance, 254 cases of lunacy were reported, followed by 95 so-called "convictions," and if these figures were deducted from the totals a more correct statement of the real offences against law and order would, of course, be presented.

Charges dealt with under the First Offenders' Act.—This Act, which was passed in 1892, provided a means for dealing leniently with offenders who had not previously been convicted and suffered imprisonment, and who, therefore, were presumed to be still unhardened by the influences of criminal life, as it was thought that if on their first offence they were spared the degradation of prison life, with its enforced evil companionship, their chance of turning from the path of lawlessness would be considerably enhanced. The provisions enacted for dealing with cases of this kind varied according to the circumstances of the case. The charge might be "dismissed on proof," a procedure somewhat similar to the "cautioning" already referred to. During 1902, 49 persons were so dealt with, mostly on charges of larceny. The charge again might be "dismissed on payment of damages and costs." During 1902, such charges numbered 10, five of them being cases of larceny. The person also might be "convicted and discharged on recognisance." The number so treated during 1902 was 17, larceny being again the principal charge. Finally, the person could be "convicted and discharged on recognisance, and subject to payment of damages and costs." This course, during 1902, occurred in 15 instances, mostly also of larceny. The First Offenders Act, 1892, was repealed by the Criminal Code of 1902, which, however, in its 654th section, embodies provisions similar to those of the original Act.

Juvenile Crime.—There is a considerable amount of uncertainty as to what should be regarded as the age-limit at which a juvenile criminal becomes an adult. The laws of different countries vary greatly on this point, and it seems difficult to fix upon a definite age.

The Criminal Code, adopted in 1902 by our own legislature (1 & 2 Edwardi VII., No. 14), is similar to the Imperial law in this respect. It provides that children under the age of seven years are not criminally responsible for any act or omission. Children above this age, but who have not yet attained the age of fourteen, can only be held criminally responsible if it is proved that at the time of doing the act, or making the omission, they were capable of knowing that they should not have so offended.

There can be little doubt as to the desirableness of differentiating in the method of dealing with youthful criminals. Here, more than ever, it is essential that the punishment should be above all things corrective; and it may, possibly, be a matter for future consideration

Digitized by Google

on the part of the legislator whether the age-limit with regard to juvenile criminals can not with advantage be raised. An especially salutary method for suppressing or dealing with juvenile crime was the introduction, into the Industrial Schools Act of 1874, since amended in 1877, 1882, and more particularly in 1893, of certain clauses providing for the supervision and training of juvenile offenders in educational and reformatory establishments entirely distinct from the prisons.

To obtain a correct estimate of the amount of juvenile crime at present in evidence in Western Australia, a very careful analysis of the figures available is necessary. The police records contain a multiplicity of charges representing the whole of the work carried out in the Courts of Justice during the year. Many of these are only indirectly or remotely connected with criminality. First of all, every case concerning children under seven years of age must be eliminated from the number; next, among the charges relating to juveniles as legally so defined, there is one of "being neglected children." It stands to reason that this charge cannot properly be counted as crime. The number of neglected children in 1901, from two years old to 15, was as follows: males, under seven, 8; seven to thirteen, 14; fourteen and fifteen, 5; female, under seven, 6; seven to thirteen, 20; fifteen, 2; total, 55. Thirdly, it is evident that cases relating to aboriginal juveniles, ten of whom were charged during 1901, ought not to be taken together with those of white children, the conditions and circumstances being, as a rule, so very different that the charges are scarcely, if ever, comparable. When these deductions are made, the number of juvenile criminals in Western Australia is not large, a natural consequence perhaps of the preponderance of adults in the population. For the year 1901 the charges brought before magistrates were as follows:—

Offences.	Males (Ages).							Total.	Females (Ages).		Total.	Grand Total.
	7	8	9	10	11	12	13		7	13		
Unlawfully using a horse	..	..	..	..	..	..	1	1	..	..	..	1
Larceny, simple	1	..	..	4	5	6	11	27	..	..	..	27
Larceny, prædial	1	..	1	1	4	4	6	17	1	..	1	18
Malicious injury to property ..	1	2	..	2	1	2	..	8	..	..	..	8
Unlawful possession	..	..	..	1	2	1	1	5	..	1	1	6
Unlawfully on premises	..	..	1	..	..	1	1	3	..	..	..	3
Disorderly conduct	..	..	..	..	..	1	4	5	..	..	..	5
Education Act, Breach of	..	..	..	..	..	3	1	4	..	..	..	4
Masters and Servants Act, Breach of	..	..	..	..	..	..	2	2	..	..	..	2
Municipal By-laws, Breach of ..	..	..	2	1	3	5	..	11	..	..	..	11
Obscenity	..	2	1	..	..	..	..	3				3
Railway By-laws, Breach of ..	..	..	..	..	1	..	2	3	..	..	..	3
Absconding from Industrial School ..	..	..	..	..	2	2	2	6	..	..	..	6
Other offences	1	1	1	1	1	1	1	7	..	..	..	7
	4	5	6	10	19	26	32	102	1	1	2	104

Digitized by Google

The totals for seven years may next be compared :—

	1896.	1897.	1898.	1899.	1900.	1901.	1902.
Males	66	65	71	76	76	102	94
Females	0	3	0	14	7	2	6
Totals ..	66	68	71	90	83	104	100

The total population of children between the ages of seven and 14 at the 1901 Census was 11,449 males, 11,350 females, total 22,799, and a comparison of these numbers with the figures representing juvenile crime for the same year bears favourable testimony to the general good behaviour of the children of the State.

Recent Enactments.

"The Justices Act, 1902," although dealing principally with the procedure in connection with the administration of justice in the State, contains some clauses which constitute certain acts, or conditions of life, criminally offensive.

Evil Fame.—One of these specially referred to by the Commissioner of Police in his latest report as having "worked well," and in view of results being "a very useful addition to the Statute Book," is the so-called "evil fame" clause (No. 173), which reads as follows: "When complaint in writing, on oath, is made before a justice, that any person is a person of evil fame, and the complainant therefore prays that the defendant may be required to find sufficient sureties to be of good behaviour, such proceedings may be had as are in this part of the Act mentioned."

Gold Stealing.—The Police Act Amendment Act, 1902, embodies, among others, some stringent measures with regard to gold stealing. The Commissioner of Police, however, in his report just referred to, expresses regret that the clauses are not even more drastic than they are. The new offence created by the enactment is that of having possession of gold reasonably suspected of being stolen, and being unable to prove to the satisfaction of the Magistrate that such gold was lawfully obtained.

Identification of Criminals.

On this important subject the Commissioner of Police, Captain F. A. Hare, has kindly supplied the following interesting and valuable notes: "For some considerable time great difficulty had been experienced by the police in this State in establishing the identity of criminals, the method in use being photography, supplemented by an index of tattoo marks, nationality, height, colour of hair, eyes, etc. This, although fairly satisfactory in some cases, was found to be far from perfect, the facility with which

tattoo marks can be altered, the changes in personal appearance, and errors in measurement and description, rendering identification a matter of uncertainty.

A study was made of the Bertillon system, with a view to its adoption, but the difficulty of obtaining, in the rank of the police force, men of sufficient skill and education to make the system a success proved an insuperable obstacle.

In August, 1902, attention was directed to an article on "Finger Prints, and the detection of crime in India," and as a result of this the Police Department obtained copies of the standard work on the subject, "Henry's classification and uses of finger prints." The Commissioner of Police having approved the adoption of the system as at present in force in England, a commencement was made in January last, members of the police force stationed at those places where there is a gaol being instructed in the method of taking the impressions.

The system, as at present in force, is as follows: On receipt of a prisoner at a gaol, his finger prints are at once taken by a police officer (at Fremantle Prison by the police photographer) on the form supplied, which contains also a personal description, and record of offence and sentence. The form is forwarded to the Criminal Investigation Department, Perth, where it is classified, and compared with the records already received, for the purpose of identifying the prisoner if already convicted under another name.

A brief summary of the method of classification may be of interest:—The impressions are arranged in two classes, viz., loops (including arches and ulnar and radial loops) and whorls (including central and lateral pockets, twinned loops and accidentals). Combinations of these two classes, formed by taking the ten digits in pairs, provide a primary classification in 1,024 classes. These are subclassified by the occurrence of arches and ulnar and radial loops in the index and middle fingers of both hands; further sub-divided by counting and tracing the ridges (as the elevations between the lines on the fingers are called), and still further subdivided by counting the ridges of the right little finger. By this method classification can be extended almost indefinitely.

The forms are kept between file boards, and placed in pigeon holes numbered in accordance with the system of classification, which is so complete that a search through a collection of 30,000 records can be made in a few minutes.

The great advantages of Henry's system are:—

1. Simplicity of working.
2. Small cost of material.
3. All skilled work is carried out at the Central Office.
4. Rapidity with which records are taken
5. Absolute certainty of identification.

Digitized by Google

The working of the system in this State is entirely carried out by the Police Department, which was the first to initiate a scheme of interchange of finger prints, by forwarding to the Eastern States reduced photographs of the impressions, a practice which must, in course of time, prove of the greatest assistance in the identification of habitual criminals, and consequently lend considerable aid towards the suppression of crime.

The desirability of the general adoption of this system of identification throughout the Commonwealth of Australia was at once recognised by Captain Hare, and it is gratifying to note that, at the recent Conference, in Melbourne, of the Police Commissioners of the six States of the Commonwealth, his suggestion to this effect was favourably received, and a uniform scheme for identification and classification, to be used throughout the Commonwealth, was unanimously agreed upon.

Police Commissioners' Conference.

As early as June, 1903, a suggestion was made to the Government by the local Commissioner of Police that it was desirable, if possible, to arrange for a Conference to be held of all the Commissioners of Police of the States of the Commonwealth, and of New Zealand, at an early date, for the purpose of bringing Australasian police methods into line, and establishing, as far as possible, a uniform system of police work. The concurrence of the several Governments having been obtained, the necessary arrangements were made, and the delegates of the six federated States met in Melbourne in November, 1903, New Zealand being, unfortunately, unable to take part.

The results of this Conference were of a most satisfactory nature. The main points decided upon have been set forth in a report recently presented to the Government.

As regards the identification of criminals in the five other States, the work of taking photographs and finger-prints is, or will shortly be, undertaken by the gaol departments, and to bring the system as enforced here into line with that followed by our neighbours, the Commissioner has asked for authority to hand over the work to the gaol department. A proposal as to the interchange of police was unanimously agreed to by the members of the Conference, and now only awaits the authority of the several State Governments to be at once put into practice.

The proposed interchange will, it is thought, afford selected members of the force of each State an opportunity—which they have not hitherto possessed—of becoming personally acquainted with the more prominent criminals in other States beside their own, which should be of the greatest assistance to them in recognising new arrivals, or in ascertaining the present whereabouts of old offenders who have before been under their notice. Under this system it is proposed to mutually exchange each year, for a period of from three weeks to

Digitized by Google

month, one or two detectives or plain clothes constables specially selected for this particular work, who will, whilst they are on their visit, be told off for such special duty, in company with local men picked for the purpose, as will give them every opportunity of becoming thoroughly acquainted with the criminal society of the State visited.

In addition, recommendations have been made by the Conference with regard to the methods of dealing with fugitive offenders, the influx of criminals from other parts, habitual criminals, etc., etc.

Court Sessions.

An estimate of the amount of Criminal and Civil Court business done in each Magisterial District of the State may be formed from the returns annually supplied by the Registrar of the Supreme Court, the Magistrates, Government Residents, and Wardens of the goldfields. The returns of the Criminal Courts thus supplied cannot very well be compared with those furnished by the Police Department, as the manner of compilation is not in every respect the same. The following table gives the number of cases dealt with during 1901 in each of the Superior Courts, and also the number of convictions :—

Place where held.	Offences by—						Total Offences.	
	White Races.		Coloured Races.					
			Aborigines.		All others.			
	Cases tried.	Convictions.	Cases tried.	Convictions.	Cases tried.	Convictions.	Cases tried.	Convictions.
Supreme Court—								
Perth	116	76	2	2	3	..	121	78
Derby ..	..	..	7	7	..	..	7	7
Courts of Quarter Sessions—								
Albany ..	2	1	..	..	..	..	2	1
Broome ..	..	..	..	..	1	1	1	1
Bunbury ..	4	4	..	..	..	..	4	4
Coolgardie ..	12	9	..	..	..	..	12	9
Cue	11	8	..	..	..	..	11	8
Derby ..	1	1	5	3	..	..	6	4
Geraldton ..	5	4	..	..	3	3	8	7
Kalgoorlie ..	53	37	..	..	..	..	53	37
Roebourne ..	1	..	..	..	2	2	3	2
Wyndham ..	1	..	..	..	..	..	1	..
Total ..	206	140	14	12	9	6	229	158

The 14 offences charged against aborigines were all stated to be "offences against the individual." Of the 9 charges against other coloured races, 3 were "against property," 2 "against the individual," and 4 "against the public." The 206 charges against white offenders were made up as follows :—147 "against property," 50 "against the individual," and 9 "against the public."

Digitized by Google

The Indictable Offences and Commitments in the Courts of Petty Sessions throughout the State, during 1901, were as follows :—

Place where held.	Indictable Offences by—						Total Indictable Offences.	
	White Races.		Coloured Races.					
			Aborigines.		All others.			
	Cases tried.	Commitments.	Cases tried.	Commitments.	Cases tried.	Commitments.	Cases tried.	Commitments.
Albany	1	1	..	..	..	..	1	1
Beverley	2	2	1	..	..	..	3	2
Boulder	11	9	..	..	..	..	11	9
Bridgetown ..	8	1	..	..	..	..	8	1
Broad Arrow ..	1	1	..	..	..	..	1	1
Broome	..	..	3	..	6	4	9	4
Bulong	3	1	..	..	..	..	3	1
Bunbury	3	1	..	..	..	..	3	1
Busselton	1	1	..	..	..	..	1	1
Carnarvon	1	..	..	..	..	..	1	..
Collie	5	1	..	..	..	..	5	1
Coolgardie	18	14	..	..	..	..	18	14
Cue	17	11	..	..	..	..	17	11
Derby	1	1	5	3	..	..	6	4
Fremantle	31	22	..	..	..	..	31	22
Geraldton	3	3	1	1	2	2	6	6
Greenough	1	1	..	..	..	..	1	1
Guildford	1	1	..	..	..	..	1	1
Jarrahdale	3	3	..	..	..	..	3	3
Kalgoorlie	89	30	..	..	..	..	89	30
Kanowna	1	..	..	..	..	..	1	..
Kojonup	1	1	..	..	..	..	1	1
Laverton	4	3	..	..	..	..	4	3
Lawlers	1	1	..	..	4	..	2	1
Leonora	3	3	..	..	..	..	3	3
Marble Bar ..	2	1	1	1	2	1	5	3
Menzies	5	5	..	..	..	..	5	5
Moora	..	..	1	1	1	1	2	2
Mt. Magnet ..	5	3	..	..	..	..	5	3
Mt. Malcolm ..	9	1	..	..	..	..	9	1
Nannine	1	1	..	..	..	..	1	1
Narrogin	..	..	1	..	..	..	1	..
Northam	16	10	..	..	..	..	16	10
Northampton ..	..	..	..	..	1	1	1	1
Nullagine	1	..	..	..	..	..	1	..
Peak Hill	1	..	..	..	..	..	1	..
Perth	152	64	3	..	6	2	161	66
Southern Cross ..	3	2	..	..	..	..	3	2
Williams	2	1	..	..	..	..	2	1
Wiluna	1	1	..	..	..	..	1	1
Wyndham	..	..	2	2	..	..	2	2
Yalgoo	..	..	1	1	..	..	1	1
Total	408	201	19	9	19	11	446	221

The 408 charges against whites were made up as follows: 252 "against property"; 127 "against the individual"; and 29 "against the public." Of the 19 charges against aborigines, 17 were offences "against the individual," the other 2 being "against property." Of the 19 charges against other coloured persons, 9 were "against property," and 10 "against the individual."

The bulk of the Criminal charges are of offences triable summarily in the Courts of Petty Sessions.

Digitized by Google

The details for the separate Courts for the year 1901 were:—

Place where held.	Offences triable summarily charged against.						Total offences triable summarily.	
	White Races.		Coloured Races.					
			Aborigines.		All Others.			
	Cases tried.	Convictions.	Cases tried.	Convictions.	Cases tried.	Convictions.	Cases tried.	Convictions.
Albany	405	244	..	..	7	7	412	251
Beverley	68	53	7	7	1	1	76	61
Boulder	595	351	..	..	4	4	599	355
Bridgetown ..	24	16	3	3	2	2	29	21
Broad Arrow ..	89	83	..	..	..	..	89	83
Broome .. .	30	21	22	18	134	121	186	160
Bulong	74	68	..	..	..	..	74	68
Bunbury	380	340	3	2	..	..	383	342
Busselton ..	38	26	7	7	..	..	45	33
Carnarvon ..	60	48	21	19	36	29	117	96
Collie	119	53	..	..	..	..	119	53
Coolgardie ..	630	449	8	8	..	..	638	457
Cossack	17	11	19	14	31	21	67	46
Cue	250	205	13	8	16	7	279	220
Derby .. .	11	10	9	9	..	..	20	19
Dongara	20	16	1	..	1	..	22	16
Donnybrook ..	28	20	..	..	1	1	29	21
Esperance ..	6	4	..	..	..	..	6	4
Fremantle ..	2,113	1,839	9	9	21	13	2,143	1,861
Geraldton ..	203	174	1	1	28	17	232	192
Gingin	2	2	..	..	..	..	2	2
Greenbushes ..	57	30	..	..	1	1	58	31
Greenough ..	6	5	..	..	..	..	6	5
Guildford	188	161	13	13	6	6	207	180
Hall's Creek ..	1	1	33	28	..	..	34	29
Jarrahdale ..	23	23	..	..	..	..	23	23
Kalgoorlie ..	772	588	..	..	..	..	772	588
Kanowna	234	211	1	1	..	..	235	212
Katanning ..	33	18	2	2	..	..	35	20
Kojonup	9	8	..	..	..	..	9	8
Kunanalling ..	6	6	..	..	..	..	6	6
Laverton	111	66	..	..	..	..	111	66
Lawlers	172	165	2	2	4	2	178	169
Leonora	179	154	..	..	4	4	183	158
Marble Bar ..	44	36	15	10	19	14	78	60
Menzies	305	268	2	1	16	5	323	274
Midland Junction	145	141	..	..	..	..	145	141
Moora	20	18	3	3	..	..	23	21
Mount Gould ..	..	..	9	9	..	..	9	9
Mount Magnet ..	63	55	8	6	4	3	75	64
Mount Malcolm ..	39	28	..	..	..	..	39	28
Mount Morgans	113	69	1	1	..	..	114	70
Nannine	39	38	..	..	2	2	41	40
Narrogin	17	17	1	1	..	..	18	18
Newcastle	47	42	14	14	4	2	65	58
Norseman ..	85	68	..	..	11	9	96	77
Northam	504	389	11	8	18	15	533	412
Northampton ..	11	7	2	1	..	..	13	8
Nullagine	44	21	28	28	15	15	87	64
Onslow	24	14	14	10	6	5	44	29
Peak Hill	106	71	..	..	..	..	106	71
Perth	4,787	4,174	8	7	209	180	5,004	4,361
Pinjarra	38	26	1	1	..	..	39	27
Ravensthorpe ..	15	14	..	..	..	..	15	14
Roebourne ..	35	25	15	13	26	20	76	58
Southern Cross ..	74	66	1	1	1	1	76	68
Tableland	..	..	3	3	..	..	3	3
Wagin	34	29	1	1	..	..	35	30
Whim Creek ..	6	6	3	1	2	2	11	9
Williams	11	10	5	5	..	..	16	15
Wiluna	51	49	2	2	..	..	53	51
Wyndham ..	19	11	97	87	..	..	116	98
Yalgoo	25	17	3	..	..	..	28	17
York	107	46	4	4	..	..	111	50
Total	13,761	11,224	425	368	630	509	14,816	12,101

Digitized by Google

The charges, to the number of 13,761, against persons of European extraction, were made up as follows: "Against the public," 4,199; "against the individual," 970; "against property," 1,232; "drunkenness," 3,320; "other offences," 4,040. Those concerning aborigines comprised 112 "against the public"; 47 "against the individual"; 156 "against property"; 54 charges of drunkenness, and 56 other offences; making a total of 425 charges. The balance of 630 cases tried, those in which other coloured persons were charged, comprised 137 "against the public"; 85 "against the individual"; 48 "against property"; 30 charges of drunkenness, and 339 other charges.

A true comparison of the proportion of crime occurring in the various Magisterial Districts can, of course, only be made on a population basis. First of all, then, the offences charged against aborigines must be omitted. Further, it is evident that the offences disposed of in the Superior Courts, as given in the present returns, cannot be used, since the places of trial for these are, in a large proportion of the cases, not in the districts where the offences have been committed. The number of cases tried does not really afford a true index of the actual amount of crime committed, but rather perhaps discloses the degree of activity displayed by the police in a special district, and it is consequently, therefore, not the most suitable for purposes of comparison. Probably the nearest approach to reliable figures for the distribution of crime in the various portions of the State may be made by taking jointly the commitments for trial on charges of indictable offences, and the convictions on charges of offences triable summarily, there being, presumably, in connection with cases coming under both these headings, a sufficient amount of evidence as a rule to warrant the assumption of guilt. These figures, with regard to the number of offences, charged against all persons except aborigines, have been used in the following table for the year 1901, the population given for each Magisterial District being that in the district at the time of the Census then taken.

The percentages for the various districts present features of the greatest interest. Deductions must, however, be made with the utmost caution. The difference in the manner in which the administration of justice in each district individually is carried out must be borne in mind. The individual conceptions as to the best mode of dealing with offences vary greatly in different Magistrates, some act with great severity, others with leniency; the degree of ability and knowledge as to the proper interpretation and intention of the law varies also considerably in different individuals. These factors must necessarily influence the resuks of the year's Court Sessions to a very great extent, and must naturally, in many instances, have a direct bearing on the Criminal Statistics of the district. Furthermore, it would be unwise to attach much importance to the

Digitized by Google

percentages for districts where the population is but scanty, as there the factor of chance is not always sufficiently neutralised by large numbers. But making due allowance for these facts, certain features are, nevertheless, so prominent in the figures of the last column of the above table, that their importance cannot well be reasonably denied.

Magisterial District.	Population at Census.	Summary Convictions.	Commitments for trial.	Convictions and Commitments for Trial.	Percentage to Population of District.
Ashburton	361	19	..	19	5·26
Blackwood	2,291	70	1	71	3·10
Broad Arrow	1,613	83	1	84	5·21
Broome	1,704	142	4	146	8·57
Collie	1,412	53	1	54	3·82
Coolgardie	8,315	455	14	469	5·64
Coolgardie, East ..	26,101	943	39	982	3·76
Coolgardie, North ..	4,710	273	5	278	5·92
Coolgardie, North-East ..	2,690	279	1	280	10·41
Dundas	1,593	77	..	77	4·83
Esperance	534	4	..	4	0·75
Fremantle	23,633	1,852	22	1,874	7·93
Gascoyne	863	77	..	77	8·92
Katanning	3,027	72	1	73	2.41
Kimberley, East ..	84	11	..	11	13·10
Kimberley Goldfield ..	156	1	..	1	0·64
Kimberley, West ..	276	10	1	11	3·99
Mount Margaret ..	4,291	321	7	328	7·64
Murchison	4,522	310	15	325	7·19
Murchison, East	1,582	216	2	218	13·78
Murray	3,618	49	3	52	1·44
Northam	4,447	404	10	414	9·31
Peak Hill	677	71	..	71	10·48
Perth	43,798	4,354	66	4,420	10·09
Phillips River	501	14	..	14	2·79
Pilbara	1,042	86	2	88	8·45
Plantagenet	6,194	251	1	252	4·07
Roebourne	1,041	85	..	85	8·17
Sussex	1,988	26	1	27	1·36
Swan	7,929	310	1	311	3·92
Toodyay	3,075	62	1	63	2·05
Victoria	6,276	219	7	226	3·60
Wellington	6,860	340	1	341	4·97
Williams	554	10	1	11	1·99
Yalgoo	780	17	..	17	2·18
Yilgarn	1,546	67	2	69	4·46
York	4,040	100	2	102	2·52
Total	184,124	11,733	212	11,945	6·49

One cannot help but notice that, with unfailing regularity, the percentages in the agricultural districts are particularly low, whilst those in the more populous towns are, on the contrary, high. In the Northern districts the proportions are also high, possibly owing, to a great extent, to the presence in most of the Northern ports of a considerable admixture of persons of coloured race among the population. The percentages in the Southern coastal districts are, at any rate, in most cases decidedly lower. It will be seen, too, that in districts where there has been during the year a lesser degree of industrial progress, the percentages are mostly low. This is particularly noticeable in comparing the figures for various goldfields. Those for the East Coolgardie district

Digitized by Google

certainly appear to form an exception to all the rules just observed. It must, however, not be forgotten that a large number of the offenders convicted in the Eastern Goldfields districts are committed to Fremantle prison. On being released, many of them are without the means to travel far, and naturally flock to the near capital, where they help to swell the percentage of criminally disposed persons.

Examinations of lunatics, as recorded in the various Courts during 1901, numbered 238, Perth accounting for 75 of these; Kalgoorlie for 28; Fremantle for 25; Albany for 12; Boulder for 11; and Geraldton for 11.

Coroners' Inquests, according to the returns, were held on 270 males and 37 females, whilst 38 fire inquests were held resulting in 6 verdicts of arson, and 19 open verdicts, the remaining 13 fires being traced to accidents. In connection with the Coroners' Inquests it may be mentioned that the death registers in the Registrar General's office for the year 1901 only account for 245 of the male and 31 of the female deaths, consequently, through the neglect of the persons legally responsible for their registration, the deaths of 25 males and 6 females still remain unnotified and unregistered. The majority of the deaths were traced to accidents, no less than 21 males and 2 females having died from railway accidents alone, and 24 males and 3 females from drowning. Thirty-seven males and 5 females were recorded as having committed suicide.

The returns of civil cases furnished by the various courts will be hereafter dealt with in conjunction with the Supreme Court business.

Strength of Police Force.

With regard to the strength of the police force employed in the State on the 30th June, 1903, the report of the Commissioner furnishes the following figures: The total force numbered 500 men, including seven inspectors; seven sub-inspectors; 26 sergeants; 27 corporals; 131 mounted constables; 256 foot constables; 28 water police, and 16 detectives. Horses were in use to the number of 305. The metropolitan police force alone, exclusive of suburbs, numbered 109. On the 30th June, 1902, the total force numbered 512, and 519 on the 30th June, 1901.

Gaols and Prisoners.

There were, at the end of the year 1902, eleven proclaimed prisons in Western Australia, of which the old Imperial prison at Fremantle is the principal one and the one mainly used, and in addition to them, not including police lock-ups, twelve police gaols. The native prison at Rottnest also continued still in use, although its abolition had some time previously been decided upon. Besides

Digitized by Google

Fremantle, the other ten proclaimed prisons are situated at Albany, Broome, Bunbury, Busselton, Carnarvon, Geraldton, Newcastle, Roebourne, Wyndham, and York. The police gaols are at Bridgetown, Collie, Coolgardie, Cue, Derby, Kalgoorlie, Marble Bar, Menzies, Mt. Malcolm, Mt. Morgans, Perth, and Southern Cross. Until September, 1902, Derby possessed a proclaimed prison: the building, however, having become too dilapidated for this purpose, was closed at the end of that month, and the prisoners were divided between the Broome and Roebourne gaols. Since then, a police gaol has been proclaimed there in its place. There is, taking the prisons and police gaols jointly, and including Rottnest as a prison, accommodation for 1,078 prisoners, the maximum number of prisoners for whom accommodation is provided in the prisons being 951, and in the police gaols 127. Cells intended for one prisoner only are provided in the prisons to the number of 330, and in the police gaols to the number of 24. The Fremantle prison alone has 283 cells for single prisoners, exclusive of punishment cells. In addition to these, it has 89 double cells, and an infirmary capable of accommodating 20 persons.

In the figures relating to the criminal population for 1902, all prisoners confined in the prisons and police gaols have been included, as also those in the Boulder lock-up. During the years previous to 1900, the Rottnest prisoners were not included in the figures published by the Inspector of Prisons, as the Rottnest Native Prison was not then under that officer's supervision. The totals, however, are not materially affected by this omission, as the Rottnest quota formed but a small proportion of the total prison population.

The number of prisoners of the State on the 31st December, 1902, was 535. Its increase during the preceding decade has certainly not proportionately kept pace with that of the population, for while the latter shows a considerably more than three-fold increase, the number of commitments to prison only rose in the proportion of two to five, viz., from 1,455 in 1893 to 3,475 in 1902. Strangely, the sentences of "one year" or more do not show any consistent change in either direction, the fluctuations alternating upwards and downwards, but never deviating far from a constant average. The number of "five years" or more sentences from 18 in 1893, rose to 41 in 1897, fell as low as 7 in 1899, and finally rose to 26 in 1902. That of one year and under five years, from 198 in 1893, rose to 257 in 1897, fell to 143 in 1889, rose again to 206 in 1901, and fell once more to 160 in 1902. On the other hand a regular increase took place in the sentences of three months and under one year, which from 194 in 1893, rose to 605 in 1898, then fell to 390 in 1899, after which the figures fluctuated, amounting finally to 464 in 1902. Similarly the sentences of less than three months increased from 958 in 1893, to 1,659 in 1897, then fell to 1,169 in 1898, reached

Digitized by Google

a total of 2,141 in 1901, and fell again to 1,797 in 1902. The 535 prisoners in custody on the 31st December, 1902, comprised 492 prisoners under sentence, of whom 17 were females, whilst among the remaining 475 males there were no less than 122 aborigines. A considerable number of these were completing sentences of penal servitude, the number, at the end of 1902, being 95, of whom 76 were of European extraction, 19 of them having originally been "Imperial Convicts." The number of penal servitude prisoners is, of course, now rapidly diminishing. Fifty of them, at the date mentioned, were employed on various public works, chiefly at Fremantle; 26 were ticket-of-leave holders in private employ, and 18 were conditional release holders. During 1902, seven certificates of freedom, two conditional releases, and one certificate of remission of sentence were issued to men undergoing this form of punishment, the latter being, as already stated, no longer included in the sentences now passed.

Of the 3,475 commitments during 1902, only 2,447 were commitments of prisoners under sentence, the balance consisting of 25 debtors and 1,003 persons detained for safe custody or want of security. Fremantle alone received 1,550 of the total number of 3,475, 203 of whom were females, whilst 1,211 only of the 1,550 were prisoners under sentence. Out of the 2,447 commitments under sentence, in all the prisons, 265 were aborigines, eight of whom were females. The total number of females of all races committed was 286. Out of the whole number of sentenced prisoners, 31 only were under 17 years of age, 29 of them being males.

The total number of those in confinement, during the year 1902, who were released on the expiration of their sentence numbered 2,095, whilst those who received remission numbered 260. One prisoner died while undergoing his sentence, one was executed, and seven sentenced prisoners escaped. Two hundred and forty-three sentenced prisoners were, during the same period, transferred to other prisons or institutions. The releases on the expiration of the term of sentence, although no doubt accounting for the bulk of the discharges, were probably not quite so numerous as the figures seem to indicate, it being evident from the returns that in many instances the statement "remission" has been inadvertently omitted.

The 2,447 commitments of prisoners under sentence represented 1,867 distinct prisoners, 1,721 of whom were males, and 146 females. The youngest member of this number was a Cingalese boy, twelve years old. Next came an aboriginal boy of 13, then another aboriginal of 14, three boys of 15, nineteen boys of 16, and two girls of 16, making in all a total of twenty-seven children under the age of 17. As it has already been shown that the commitments of these numbered 31, it will be seen that some of them were committed to gaol more than once during the year. It is to be regretted that children of so tender an age could not rather, perhaps, have conveniently found a more suitable asylum in a reformatory, especially as their number is fortunately as yet but

Digitized by Google

small. The following table gives a list, distinguishing age and sex, of the total number of distinct prisoners confined during 1902:—

	Males.			Female.			Male and Female.		
	Under 17 years.	17 years and over.	Total.	Under 17 years.	17 years and over.	Total.	Under 17 years.	17 years and over.	Grand Total.
Aborigines ..	9	234	243	..	6	6	9	240	249
Other ..	16	1,462	1,478	2	138	140	18	1,600	1,618
Total ..	25	1,696	1,721	2	144	146	27	1,840	1,867

It will be seen that the number of aboriginal offenders was less than one-sixth of the total number, and, excluding the aborigines, that the proportion of male to female offenders was as 21 to 2.

The 1,840 offenders who had either reached, or passed, the age of 17, consisted of 23 aged 17 years, 46 of the age of 18 years, 40 of 19 years, 58 of 20 years, 223 between the ages of 21 and 25 years, 382 between 25 and 30 years, 278 between 30 and 35 years, 220 between 35 and 40 years, 182 between 40 and 45 years, 106 between 45 and 50 years, 84 between 50 and 55 years, 45 between 55 and 60 years, 39 between 60 and 65 years, 33 between 65 and 70 years, 13 between 70 and 75 years, 5 between 75 and 80 years, 2 between 80 and 85 years, and one between 85 and 90 years; whilst the ages of 60 prisoners were not stated. There were altogether 194 prisoners who had not yet attained the recognised adult age. The prisoners between the ages of 25 and 30 years were more numerous than in any other age group, and although it must not be lost sight of that the same age group at the time of the Census was the population group most numerously represented, and was probably equally so during the year now under review, still the proportion to the other age groups in the case of the criminals was a much higher one than it was in the case of the population. For taking, as a fair basis of comparison, the ages between 17 and 50 years, we find that the prisoners between those ages numbered 1,558, and the population at the Census under the same grouping was 110,857, whilst the population between the ages of 25 and 30 numbered 24,499. The 382 prisoners between the ages of 25 and 30, therefore, obviously formed a decidedly larger ratio, as compared with the 17--50 portion of the criminal population, than did the 24,499 persons between 25 and 30 amongst the corresponding section of the Census population.

Three prisoners were over 80 years of age, and when it is seen that two of these were each committed more than once during the year, it may not inappropriately be asked whether these men could not more suitably perhaps find a place in some charitable institution, rather than in a prison, they being probably no longer entirely accountable for their actions.

Digitized by Google

If the ability to read and write may be taken as a fair standard of education, this standard cannot be said to be low among Western Australian prisoners, for only 444 males and 22 females were shown to be illiterate, and of these 242 males and six females were aborigines, whilst eight females were half-castes, and the bulk of the remaining males Asiatics.

As might be expected, the number of prisoners born in Western Australia, after subtracting the aborigines, is relatively small. In making deductions, however, from the totals, here, as in other particulars relative to the prisoners, it is unwise to place too great a reliance on their correctness, there being, of course, almost unlimited scope for wilful as well as unintentional misstatement of the facts on the part of the prisoner when questioned. On the other hand, except in those cases where special reasons exist for frequent misstatements of a particular kind being made, the figures may, as a rule, be accepted as giving a fairly accurate view of the facts, especially where the numbers dealt with are large. Whether the very large proportion of female prisoners shown as being of Western Australian birth, as compared with the locally-born males, is traceable to some such cause as above indicated, must, of course, remain a matter for speculation; but it certainly seems remarkable that of the 604 male Australians only 85 were West Australians, whilst among 72 Australian-born women no less than 32 were found to be natives of our own State. The following is a tabular statement of the principal nationalities represented among the prison population during 1902:—

Nationality, etc.	Males.	Females.	Total.
Western Australia	85	32	117
New South Wales	115	12	127
Victoria	274	23	297
Queensland	24	..	24
South Australia	87	3	90
Tasmania	19	2	21
Total Australians	604	72	676
New Zealand	16	4	20
Australian Aborigines	243	6	249
Half-caste Aborigines	6	10	16
Total Australasia	869	92	961
England and Wales	273	18	291
Scotland	99	1	100
Ireland	164	25	189
Total United Kingdom ..	536	44	580
Britons born elsewhere	13	1	14
Germans	27	3	30
Sweden and Norway	35	..	35
Italians	18	2	20
United States of America ..	27	2	29
Chinese	39	..	39
Japanese	12	..	12
Malays	36	..	36
All others	109	2	111
Grand Total	1,721	146	1,867

Digitized by Google

From the above it would appear that Victoria holds the unenviable distinction of having supplied the largest number of prisoners which, however, is at once accounted for by the fact that at the Census she was found to be much more numerously represented among the adult population than any other State or country. England, with which Wales is included, ranks second, with 291 prisoners. Ireland contributed 189, and Scotland 100, making the total from the United Kingdom 580. When it is recognised that a very considerable proportion of these were men over 50 years of age, it will be readily understood that many of them belong to that class which cannot, unfortunately, be considered as consisting of legitimate emigrants. As regards the remaining prisoners, the majority was contributed by the other States of Australia.

A considerable number of the prisoners are old habitual offenders, and some have been in gaol more often than can be readily ascertained. In 1902, one woman, it was stated, had no less than 123 previous convictions. Of the males, 1,090 were convicted for the first time, and of the females 46, leaving a balance of 631 males and 100 females who had been convicted more than once. The following table shows the total number of distinct prisoners committed under sentence during 1902, classified according to age groups, and also to the total number of their convictions during the year :—

Number of Convictions during year.	Under 17 years.		17 and under 21.		21 and under 40.		40 and over.		Total.		Total Males and Females.
	M.	F	M.	F.	M.	F.	M.	F.	M.	F.	
One ..	23	2	130	7	860	60	421	20	1,434	89	1,523
Two ..	1	..	24	2	97	23	81	9	203	34	237
Three ..	1	..	4	..	25	5	17	3	47	8	55
Four ..	..	..	..	..	11	..	9	2	20	2	22
Five ..	..	..	..	..	8	2	2	..	10	2	12
Six ..	..	..	..	..	2	1	1	1	3	2	5
Seven ..	..	..	..	..	1	3	2	1	3	4	7
Eight ..	..	..	..	..	..	2	..	..	..	2	2
Ten ..	..	..	..	..	..	2	..	..	..	2	2
Eleven ..	..	..	..	..	..	1	1	..	1	1	2
Total ..	25	2	158	9	1,004	99	534	36	1,721	146	1,867

As regards the alleged religion of the prisoners, it is not easy to obtain anything like a reliable estimate of the real number actually belonging to any religious denomination. The statements made by prisoners in this respect are, as a rule, less truthful, if possible, than any other. The fact that only two religions—Church of England and Church of Rome—are officially ministered to in the prisons, no doubt affects the nature of the prisoners' answers, especially when

Digitized by Google

influenced by that natural tendency to evasion, which may be assumed pre-eminently to exist among criminals. The figures are as follows :—

Nominal Religion.	Males.	Females.	Total.
Protestants	719	50	769
Roman Catholics	634	89	723
Other Christians	40	..	40
Mahomedans	47	..	47
Confucians	24	..	24
Buddhists	11	..	11
Others	246	7	253
Total	1,721	146	1,867

Under the heading "others" are included the greater number of the aborigines, who are usually stated to be "Pagans." It would appear, as might naturally be expected from the composition of the population, that the Protestant denomination, when its various sects are all taken together, is the most largely represented, but the number of Roman Catholics is strangely close behind. In view of the fact that the Census figures place the number of adherents of the Church of Rome in Western Australia at less than one-fourth of the population, there is reason to suspect that, owing to the causes already indicated, the figures with regard to this section of the prisoners are not altogether reliable.

It has been remarked by most writers on criminology that want of technical training is one of the principal concomitants, if not perhaps one of the direct causes of crime. This opinion is borne out by the figures relating to prisoners in Western Australia. For not only were 199 male and 115 female prisoners during 1902 recorded as being without definite occupation, but no less than 760 of the men committed to gaol were described as "labourers," and 24 of the women as "servants," which means, it may be safely assumed, that the majority were unskilled in any specific trade. Far too well represented also were those trades and occupations which lend themselves readily to evasion of the severer tests of technical training, and in which consequently the supply is often much in excess of the demand. There were, for instance, 27 "clerks," 53 "cooks," and 66 "miners," whilst no less than 173 offenders were "sailors or seamen," who are, properly speaking, men who can hardly be regarded as belonging to the settled population of the State, and who were only for the most part guilty of the minor offences of drunkenness, disorderliness, or disobedience. Among the other more largely represented trades were: carpenters, joiners, and cabinetmakers, 43; bakers, 16; bookmakers, 15; firemen and stokers, 26; and painters, 20.

Digitized by Google

A classification of the offences and sentences is, of course, a possible on taking the total number of commitments for its basis. the following tabulated statement the various offences have b grouped under five headings, the most numerous class, that "miscellaneous" offences, containing, with the exception of five c of piracy and one of perjury, mostly the lighter forms of crime:—

Sentences during 1902.	Against the Person.		Against Property.		Against Currency.		Drunkenness.		Miscellaneous.		Total.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Under three days	2	..	10	..	..	..	143	32	71	10	226	42
3 days and under 1 week ..	6	..	3	..	..	..	70	23	101	13	180	36
1 week and under 1 month ..	46	..	74	4	..	..	97	36	428	51	645	91
1 month and under 3 months	53	..	164	8	..	..	7	2	287	56	511	66
3 months and under 6 months	13	..	102	5	..	..	1	1	84	29	200	35
6 months and under 1 year ..	18	..	117	1	8	..	1	1	71	12	215	14
1 year and under 2 years ..	9	..	92	1	5	..	..	..	12	..	118	1
2 years and under 5 years ..	11	1	20	..	2	..	..	..	7	..	40	1
5 years and under 10 years ..	8	..	6	..	1	..	..	..	..	..	15	..
10 years and under 15 years ..	5	..	..	..	..	..	..	..	..	..	5	..
Life	4	..	..	..	..	..	..	..	..	..	4	..
Death	2	..	..	..	..	..	..	..	..	..	2	..
Total	177	1	588	19	16	..	319	95	1,061	171	2,161	286

Digitized by Google

The "miscellaneous" offences were composed for the most part of cases of "disorderly conduct," which included 313 males and 52 females; "vagrancy," 139 males and 67 females; "breaches of railway By-laws," 64 males; "abusive, threatening, obscene, or profane language," 52 males and 12 females; "being idle and disorderly," 54 males and 9 females; "disobedience on board ships," 77 males; being "stowaways," 51 males; being "rogues and vagabonds," 30 males and 6 females, etc. Closely connected with several of the foregoing classes is "drunkenness," which, as the cause also of so many more serious offences, has been classified separately. To "drunkenness" were due no less than 319 commitments of male, and 95 of female offenders. The second class in numbers, so far as male offenders are concerned, is that relating to offences against property, accounting for no less than 588 commitments of male prisoners. It is worthy of note that the female offenders in this class only numbered 19, or one-fifteenth of the total number of females committed. This fact, of course, is in consonance with the general character of female crime, which, in the main, is far less aggressive than it is in the case of males, the latter statement being confirmed by the number of offences against the person, where the males numbered 177, or nearly one-twelfth of the male total, whilst only one female was so committed out of a total of 286.

The punishments inflicted for these several offences vary from imprisonment for less than three days, to imprisonment for life, or even the sentence of death. The lightest form of imprisonment is that for a short period only, and without "hard labour;" but the majority of sentences are for "imprisonment with hard labour." The longer sentences, as late as 1902, took the form of "penal servitude," under which form part of the sentence might be served outside the prison, the prisoner still remaining under police supervision. As already stated, however, this form of punishment is now abolished.

It is not possible, of course, to lay down fixed laws for the infliction of certain sentences for certain offences, as the gravity of each offence so often depends on the attendant circumstances of the case. It will be seen, for instance, that the offence of larceny, or attempted larceny, was in some cases punished with imprisonment for less than three days, and in others with several years, in one case a sentence of no less than five years being inflicted. If the attendant circumstances in these cases were to be closely investigated, they would, it is to be concluded, prove these widely varying differences not to be attributable to mere caprice on the part of magistrates, but to the actual wilfulness and gravity of the offence committed.

It will be noticed that, as before remarked, the offences met by fairly short periods of imprisonment form a large proportion of the

Digitized by Google

whole, there being no less than 645 commitments of male, and 91 of female offenders, for periods ranging from one week to one month; 511 male and 66 female offenders with sentences from one month to three months; 200 males and 35 females with sentences from three months to six months; and 215 male and 14 female offenders who were imprisoned for less than one year but not less than six months.

It is, undoubtedly, a painful reflection, when the youthful ages of some of the prisoners are considered, that children of twelve, thirteen or fourteen years, whose sentences do not bring them under the provisions of "The Industrial Schools Act," should be exposed, for periods ranging from one week to one year, to the contaminating influences of actual prison life.

The commitments, during 1902, to sentences of penal servitude only numbered 19, of which 16 were for offences against the person. Of the latter, seven were cases of murder, and four of these were followed by "life" sentences. The number of commitments to imprisonment without hard labour included 99 males and 93 females. Of the female portion 56 were committed for "drunkenness," and 16 for "disorderly conduct." Of the male prisoners, 18 were committed for "drunkenness," and the remainder for various other minor offences, their sentences ranging from under three days, to those of six months and under one year.

Comparing the nationalities with the nature of the offences committed, it may be remarked that of the 319 cases of drunkenness among males, no less than 174, or rather more than half, were those of men born in the United Kingdom, 65 being of English or Welsh birth, 42 of Scotch, and 67 of Irish. This is probably due to the fact which has already been dwelt on, viz., that many of these offenders are old habitual gaol birds, whose lives were early wrecked by crime, and whose subsequent career of idleness and uselessness is only marked by discharges from gaol and the accompanying celebration of their release, which usually leads to a speedy renewal of their career of punishment.

Glancing through the nationalities of offenders, and noting the respective lengths of their sentences, it will be observed that the majority of the sentences of one year and under two years were monopolised by the aborigines, as no less than 78 of the 118 offenders thus punished were natives. The cause of this is probably to be found in the now well-established knowledge that short sentences of imprisonment have no terror for the aboriginal native.

Digitized by Google

The following is a statement relating to the reported conjugal condition of prisoners committed under sentence during the last five years :—

Conjugal State.	1898.		1899.		1900.		1901.		1902.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Married*	332	115	203	107	284	118	417	175	275	196
Single ..	1,506	68	1,306	72	1,455	64	2,069	114	1,886	90
Total ..	1,838	183	1,509	179	1,739	182	2,486	289	2,161	286

*Comprising only those prisoners who were stated to be married at the time of commitment; all others are classed as single.

It is once again evident that these figures cannot be taken as wholly reliable. The prisoner's own testimony has to be accepted with regard to his condition, and in addition, the "single" class must necessarily include the majority of the aborigines. From the above figures it would seem as if but a small minority of the male prisoners had experienced the refining influence of feminine companionship; whilst the women, on the contrary, do not appear to have profited by the relationship, the married female prisoners far exceeding the single. This, of course, is likely enough to be the case in a country where males are so very much more plentiful than females; but it is doubtful whether at present any instructive inferences can be drawn from the fact.

Management of Prisons.—The Inspector of Prisons, whose designation has recently been changed to that of Comptroller General of Prisons, has the control of all the proclaimed prisons in Western Australia.

The expenditure of the Prison Department during 1902 was £25,293, exclusive of the expenditure on the Rottnest Establishment, which was under the supervision of its own special Superintendent. The earnings of the prisoners, so far as recorded during 1902, were estimated at £10,660, of which sum the Fremantle Prison contributed £5,823. A large portion of this amount was expended upon the domestic services of the gaols, and another large part is represented by labour employed on additions, improvements, and repairs to gaol buildings, and in the manufacture of boots, clothing, furniture, tools, etc., for the use of the prisoners. With regard to the expenditure of the Department, the establishment, in connection with Fremantle Gaol, of an experimental out-station at Hamel to provide beneficial employment for first offenders under short sentences, and prisoners nearing the end of their terms of imprisonment, was a factor responsible for a large part of the increase as compared with the previous year, when the expenditure *only* amounted to £23,484.

Digitized by Google

Discipline in the prisons is maintained by sentences of solitary confinement, restriction of diet, and occasionally, if necessity arises, by floggings. The total number of floggings for offences committed during imprisonment, in the year 1902, was six.

On the 4th January, 1904, Rottnest Prison was declared a gaol under the Prisons Act, 1903, and thus brought under the control of the Comptroller General of Prisons.

CIVIL LAW.

Supreme Court Business.—An estimate of the transactions in the Supreme Court of Western Australia, during the years 1900 and 1901, may be made from the following statement :—

		1900.		1901.	
		No.	Amount.	No.	Amount.
			£		£
COMMON LAW ..	Writs commencing Actions ..	1,105	212,888	1,115	200,067
	Judgments signed and entered ..	568	84,877	501	77,174
	Writs of *fieri facias*	318	48,933	325	36,496
	Foreign judgments	5	2,198	2	1,770
	Causes tried before Judges:				
	With jury	51	..	56	..
	Without jury ..	359	..	396	..
	Appeals	14	..	94	..
	Cases stated	20	..	19	..
	Motions made in Court	107	..	108	..
	Bankruptcy applications made in Court before a Judge in Bankruptcy	36	..	83	..
PROBATE BUSINESS ..	Probates granted	138	249,726	147	530,403
	Letters of administration issued	127	110,243	166	85,326
IN BANKRUPTCY ..	Bankruptcy Notices	35	..	42	..
	Creditors' Petitions	36	..	26	..
	Debtors' Petitions	21	..	39	..
	Total Assets	..	20,266	..	21,845
	Total Liabilities	..	23,298	..	34,532
BILLS OF SALE ..	Number registered and amount	673	722,837	671	849,367
	Satisfactions entered and amount	33	35,369	66	67,496
IN DIVORCE	Petitions for Dissolution of Marriage	15	..	16	..
	Petitions for Judicial Separation, etc.	2	..	2	..
	Decrees for Dissolution of Marriage	16	..	12	..
	Decrees for Judicial Separation, etc	3	..	2	..
COMPANIES	Number Registered and Capital	44	363,320	42	357,927
FOREIGN COMPANIES	Number Registered	73	..	62	..
NEWSPAPERS ..	Number Registered	43	..	45	..
COMMISSIONS ..	Number Issued	33	..	15	..

Digitized by Google

Supreme Court Business—continued.

		1900.		1901.	
		No.	Amount.	No.	Amount.
			£		£
	IN CHAMBERS.				
MMON LAW AND EQUITY	Summonses issued	818	..	806	..
	Orders made	811	..	850	..
	Affidavits filed	1,058	..	1,119	..
	BANKRUPTCY ACT AMENDMENT ACT, 1898.				
SECTION 7 ..	Number of Compositions ..	16	..	14	..
	Number of Schemes of Arrangement	..	..	8	..
SECTION 8 ..	Number of Deeds of Assignment	20	..	34	..
	CURATOR OF INTESTATES' ESTATES:				
TESTATES' ESTATES	Number reported and amount ..	274	8,679	242	9,445

The total amount of fees taken and duty collected in the Supreme Court rose from £1,505 in 1892, to £24,669 in 1898, and for 1901 was £13,723. The latter sum consisted of £2,315 Court Fees; £654 for registration of Bills of Sale, ; £1,010 Probate Fees; £7,220 duty on Probates and Letters of Administration; £720 Fees for registering Companies; £55 for registering Powers of Attorney; £94 for registering Firms; £136 Fees in Divorce; £1,157 Bankruptcy Fees; and £361 Fees taken by the Curator of Intestates' Estates. Fees in Lunacy only amounted to the modest sum of 15 shillings.

Local Courts.—In the Local Courts, during 1901, the sittings numbered 543, their total duration being 955 days. The number of plaints issued was 7,026; the aggregate amount recovered, £61,977; the aggregate amount of costs awarded to plaintiffs, £7,484, and to defendants, £1,020; the fees paid to revenue were £3,721, those to bailiffs amounted to £2,435; there were 68 appeals against Municipal and Road Board Rates.

Wardens' Courts.—In the 22 Wardens' Courts, during 1901, a total of 394 sittings were held, and 225 cases determined, not counting applications for leases, forfeiture of leases, or exemptions; the aggregate amount awarded was £5,732; the costs awarded to plaintiffs amounted to £607; to defendants, £165; the fees paid to revenue totalled £109, those paid to bailiffs, £440.

Digitized by Google

8.—WAGES AND PRICES.

Owing to the rapid increase of population, the cost of living has hitherto been somewhat high in towns, but is steadily diminishing. The wages of *general* domestic servants range from 8s. to £2 per week. The following are the average rates of wages for labour:—Præedial, 15s. to £3 per week; domestic (all kinds), 7s. 6d. to £2 per week.

Rates of Wages paid in Western Australia, compiled from the latest Returns under the provisions of the Industrial Statistics Act.

Occupations.	Period to which rates of Wages apply.	In the settled South-Western Districts.			On the Goldfields.*		
		Highest.	Lowest.	Average.	Highest.	Lowest.	Average.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Aerated Water Factory Hands..	Per week	2 8 0	0 15 0	1 16 0	4 10 0	2 0 0	3 10 0
Bakers	Do.	4 0 0	2 10 0	3 0 0	5 10 0	3 0 0	4 10 0
Barmaids	Do (in addition to board and lodging) ..	3 0 0	1 0 0	1 12 6	3 10 0	1 10 0	2 10 0
Barmen	Do. do. do. ..	3 0 0	1 5 0	1 10 0	3 10 0	2 0 0	2 10 0
Bicycle-makers	Do.	3 0 0	3 0 0	3 0 0	4 0 0	3 10 0	4 0 0
Blacksmiths	Do.	4 10 0	2 8 0	3 0 0	5 10 0	3 0 0	4 4 0
Boilermakers	Do.	4 1 0	3 6 0	3 12 0	5 10 0	4 10 0	4 10 0
Bookbinders	Do.	3 10 0	2 0 0	3 0 0	3 15 0	3 0 0	3 15 0
Bootmakers	Do.	3 5 0	1 15 0	2 15 0	3 0 0	3 0 0	3 0 0
Boundary Riders	Per annum (in addition to board and lodging) ..	78 0 0	45 10 0	52 0 0	..	..	..
Brewers	Per week	10 0 0	2 2 0	6 0 0	15 0 0	4 0 0	9 0 0
Bricklayers	Do.	4 4 0	3 6 0	3 12 0	6 0 0	4 10 0	4 16 0
Brickmakers	Do.	3 12 0	2 8 0	3 0 0	4 10 0	3 12 0	3 15 0
Bullock-drivers	Per annum (in addition to board and lodging) ..	78 0 0	40 0 0	60 0 0	..	..	..
Butchers	Per week	4 0 0	2 10 0	3 0 0	4 10 0	3 10 0	4 0 0
Cabinetmakers	Do.	4 10 0	1 10 0	3 0 0	..	..	..
Candlemakers	Do.	1 7 6	1 7 6	1 7 6	..	..	..
Carpenters	Do.	3 18 0	3 0 0	3 9 0	5 8 0	4 10 0	4 10 0
Carters	Do.	3 12 0	1 0 0	2 5 0	4 10 0	2 0 0	3 10 0
Coachmen	Do. (in addition to board and lodging) ..	1 10 0	0 15 0	1 5 0	..	..	..
Compositors	Do.	5 10 0	2 8 0	3 0 0	4 0 0	3 0 0	3 15 0
Cooks (male)	Do. (in addition to board and lodging) ..	4 10 0	1 0 0	2 10 0	6 0 0	2 10 0	3 10 0
Cooks (female)	Do. do. do. ..	3 0 0	0 15 0	1 10 0	4 0 0	1 10 0	2 5 0
Coopers	Do.	3 12 0	2 10 0	3 5 0	5 0 0	4 0 0	4 10 0
Cutters, Tailors'	Do.	6 0 0	3 0 0	5 0 0	6 0 0	4 15 0	5 5 0
Drapers (male)	Do.	5 10 0	2 0 0	2 10 0	6 0 0	1 10 0	3 10 0
Do. (female)	Do.	5 0 0	0 10 0	1 15 0	5 0 0	0 15 0	2 10 0

Digitized by Google

| | | |

Rates of Wages paid in Western Australia, etc.—continued.

Occupations.	Period to which Rates of Wages apply.	In the settled South-Western Districts.			On the Goldfields *		
		Highest.	Lowest.	Average.	Highest.	Lowest.	Average.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Tailoresses	Per week	4 0 0	0 10 0	1 15 0	4 2 6	1 10 0	2 5 0
Tailors	Do.	6 0 0	1 10 0	3 10 0	7 0 0	2 10 0	4 5 0
Tanners	Do.	3 0 0	2 5 0	2 10 0	..	..	..
Teamsters	Do.	3 12 0	2 2 0	3 0 0	4 10 0	3 0 0	3 10 0
Turners, Metal	Do.	3 18 0	2 14 0	3 9 0	5 10 0	4 10 0	4 10 0
Turners, Wood	Do.	3 5 0	2 15 0	3 0 0	..	..	..
Upholsterers	Do.	3 12 0	3 0 0	3 0 0	..	..	..
Waiters	Do. (in addition to board and lodging) ..	2 0 0	1 0 0	1 5 0	2 10 0	2 0 0	2 5 0
Waitresses	Do. do. do. ..	1 10 0	0 12 6	1 0 0	2 0 0	1 0 0	1 10 0
Wharf Labourers	Do.	3 10 0	3 0 0	3 0 0	..	..	..
Wheelwrights	Do.	3 15 0	2 8 0	3 0 0	4 10 0	3 0 0	4 0 0
† Government Railway Servants throughout the State—							
Gangers	Do.	3 6 0	2 14 0	3 0 0	..	..	..
Guards	Do.	3 12 0	2 11 0	3 0 0	..	..	..
Labourers	Do.	3 0 0	2 2 0	2 8 0	..	..	..
Locomotive Engine-drivers ..	Do.	4 10 0	3 6 0	3 17 6	..	..	..
Do. Firemen ..	Do.	3 0 0	2 8 0	2 15 6	..	..	..
Do. Cleaners ..	Do.	2 5 0	1 16 0	2 2 0	..	..	..
Porters	Do.	3 0 0	1 19 0	2 8 0	..	..	..
Shunters	Do.	3 0 0	2 5 0	2 11 0	..	..	..
Signalmen	Do.	3 12 0	2 2 0	3 0 0	..	..	..

* Where no rates of wages are shown, either such employment on the Goldfields is not obtainable or no returns as to wages paid have been received.
† Gangers and Repairers whilst in Goldfields Areas are paid 1s. per working day extra; other employees are given 7s per week Goldfields Allowance.

Digitized by Google

Monthly Wholesale Prices at Perth of the principal kinds of Agricultural, Orchard, and Farmyard Produce during 1902.

Description of Produce.	January.		February.		March.		April.		May.		June.	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Grain.												
Wheat .. .. per bushel ..	0 3 10	0 4 1	0 4 0	0 4 2	0 4 0	0 4 1	0 4 2	0 4 9	0 5 3	0 6 0	0 5 5	0 6 0
Oats .. .. do. ..	0 4 0	0 4 2	0 3 2	0 4 3	0 3 4	0 4 3	0 3 8	0 4 0	0 4 0	0 4 6	0 4 3	0 4 6
Barley .. .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Maize .. .. do. ..	0 4 6	0 5 0	..	..	0 4 10	0 5 0	..	..	..	0 5 6	..	..
Mill Produce.												
Flour .. .. per ton ..	9 15 0	10 0 0	9 15 0	10 0 0	9 15 0	10 0 0	11 0 0	11 12 6	11 7 6	11 12 6	11 7 6	11 12 6
Bran .. .. do. ..	6 12 6	7 2 6	7 0 0	7 5 0	6 15 0	7 5 0	8 0 0	9 0 0	9 0 0	9 5 0	9 0 0	9 5 0
Pollard .. .. do. ..	6 10 0	7 2 6	7 5 0	7 10 0	6 17 6	7 5 0	8 5 0	9 3 0	9 5 0	9 10 0	9 0 0	9 10 0
Farm Produce.												
Hay .. .. per ton ..	..	..	..	..	..	..	..	..	..	..	..	..
Chaff .. .. do. ..	2 0 0	4 7 6	3 0 0	4 2 6	2 10 0	4 0 0	3 10 0	4 10 0	3 10 0	4 12 6	3 10 0	5 7 6
Potatoes .. do. ..	6 10 0	9 10 0	6 0 0	10 0 0	4 0 0	13 10 0	6 0 0	13 0 0	8 10 0	11 0 0	8 0 0	11 0 0
Onions .. .. do. ..	5 0 0	7 10 0	6 0 0	8 0 0	7 0 0	8 5 0	7 0 0	9 0 0	8 10 0	11 0 0	8 10 0	11 0 0
Straw chaff .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Dairy Produce.												
Butter, local .. per lb. ..	0 0 11	0 1 4	0 1 2	0 1 3	..	..	..	..	0 2 0	0 2 6	0 1 6	0 2 0
Bacon .. .. do. ..	..	..	..	..	0 0 11	0 0 11½	0 0 11	0 0 11½	0 0 11	0 0 11½	0 0 11	0 0 11½
Hams .. .. do. ..	..	..	..	..	0 1 2½	0 1 3	0 1 2½	0 1 3	0 1 2	0 1 3	0 1 2	0 1 4
Eggs .. .. per dozen ..	0 1 7	0 2 0	0 1 9	0 2 1	0 1 10	0 2 0	0 2 6	0 3 1	0 1 9	0 3 0	0 1 6	0 3 0
Cheese .. .. per lb. ..	..	..	..	..	0 0 8¾	0 0 9½	0 0 8½	0 0 9½	0 0 8½	0 0 9½	0 0 9½	0 0 9½
Lard .. .. do. ..	..	..	..	..	..	0 0 10	..	0 0 10	..	0 0 10	..	..
Pork .. .. do. ..	..	..	..	..	0 0 6	0 0 6½	0 0 4	0 0 6½	0 0 3½	0 0 6	0 0 6½	0 0 7
Poultry.												
Fowls .. .. per pair ..	0 6 0	0 7 6	0 5 0	0 7 0	0 4 6	0 7 0	0 4 6	0 7 6	0 4 0	0 7 6	0 3 6	0 7 0
Ducks .. .. do. ..	0 6 0	0 7 6	0 5 6	0 6 9	0 4 6	0 6 6	0 5 0	0 6 9	0 5 0	0 9 6	0 6 6	0 9 6
Geese .. .. do. ..	0 12 0	0 15 6	..	..	..	..	0 11 0	0 11 6	..	..	..	..
Turkeys, Gobblers do. ..	1 2 0	1 10 0	..	..	1 0 0	1 1 0	0 18 0	1 1 0	..	0 17 6	0 18 0	1 2 0
Turkeys, Hens do. ..	0 10 0	0 14 6	..	..	0 10 0	0 12 0	0 10 0	0 13 0	0 10 0	0 13 0	0 9 0	0 13 0
Pigeons .. .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Fruit.												
Apples .. .. per case ..	0 7 6	1 1 0	0 3 6	0 19 0	0 5 0	1 0 0	0 5 0	0 18 0	0 7 6	0 15 0	0 7 6	0 17 0
Apples, cooking do ..	0 2 6	0 12 6	0 5 0	0 9 0	0 5 0	0 8 0	..	..	0 7 6	0 9 0	0 7 6	0 9 0
Apricots .. do. ..	0 12 0	1 6 0	..	1 0 0	..	..	..	..	..	..	..	..
Bananas .. do. ..	0 12 0	1 5 0	0 4 0	0 14 0	..	..	0 5 0	1 1 0	..	..	..	..
Oranges .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Strawberries per lb. .	0 0 2½	0 0 3	..	..	..	..	..	0 0 4	..	..	..	..
.. per case ..	0 4 6	0 13 6	0 3 0	0 16 0	0 1 6	0 8 0	0 2 6	0 9 0	0 2 6	0 4 6	..	..
.. do. ..	0 3 6	0 11 0	0 3 6	0 10 0	0 4 6	0 14 0	0 4 6	0 16 0	0 3 6	0 9 0	..	..

Rates of Wages paid in Western Australia, etc.—continued.

Occupations.	Period to which Rates of Wages apply.	In the settled South-Western Districts.			On the Goldfields *		
		Highest.	Lowest.	Average.	Highest.	Lowest.	Average.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Tailoresses	Per week	4 0 0	0 10 0	1 15 0	4 2 6	1 10 0	2 5 0
Tailors	Do.	6 0 0	1 10 0	3 10 0	7 0 0	2 10 0	4 5 0
Tanners	Do.	3 0 0	2 5 0	2 10 0	..	..	..
Teamsters	Do.	3 12 0	2 2 0	3 0 0	4 10 0	3 0 0	3 10 0
Turners, Metal	Do.	3 18 0	2 14 0	3 9 0	5 10 0	4 10 0	4 10 0
Turners, Wood	Do.	3 5 0	2 15 0	3 0 0	..	..	..
Upholsterers	Do.	3 12 0	3 0 0	3 0 0	..	..	..
Waiters	Do. (in addition to board and lodging)	2 0 0	1 0 0	1 5 0	2 10 0	2 0 0	2 5 0
Waitresses	Do. do. do.	1 10 0	0 12 6	1 0 0	2 0 0	1 0 0	1 10 0
Wharf Labourers	Do.	3 10 0	3 0 0	3 0 0	..	..	.
Wheelwrights	Do.	3 15 0	2 8 0	3 0 0	4 10 0	3 0 0	4 0 0
† Government Railway Servants throughout the State—							
Gangers	Do.	3 6 0	2 14 0	3 0 0	..	..	..
Guards	Do.	3 12 0	2 11 0	3 0 0	..	..	..
Labourers	Do.	3 0 0	2 2 0	2 8 0	..	..	..
Locomotive Engine-drivers	Do.	4 10 0	3 6 0	3 17 6	..	..	..
Do. Firemen	Do.	3 0 0	2 8 0	2 15 6	..	..	..
Do. Cleaners	Do.	2 5 0	1 16 0	2 2 0	..	..	..
Porters	Do.	3 0 0	1 19 0	2 8 0	..	..	..
Shunters	Do.	3 0 0	2 5 0	2 11 0	..	..	..
Signalmen	Do.	3 12 0	2 2 0	3 0 0	..	..	..

* Where no rates of wages are shown, either such employment on the Goldfields is not obtainable or no returns as to wages paid have been received.
† Gangers and Repairers whilst in Goldfields Areas are paid 1s. per working day extra; other employees are given 7s per week Goldfields Allowance.

Digitized by Google

Monthly Wholesale Prices at Perth of the principal kinds of Agricultural, Orchard, and Farmyard Produce during 1902.

Description of Produce.	January.		February.		March.		April.		May.		June.	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
GRAIN.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Wheat .. .. per bushel ..	0 3 10	0 4 1	0 4 0	0 4 2	0 4 0	0 4 1	0 4 2	0 4 9	0 5 3	0 6 0	0 5 5	0 6 0
Oats .. .. do. ..	0 4 0	0 4 2	0 3 2	0 4 3	0 3 4	0 4 3	0 3 8	0 4 0	0 4 0	0 4 6	0 4 3	0 4 6
Barley .. .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Maize .. .. do. ..	0 4 6	0 5 0	..	..	0 4 10	0 5 0	..	..	..	0 5 6	..	..
MILL PRODUCE.												
Flour .. .. per ton ..	9 15 0	10 0 0	9 15 0	10 0 0	9 15 0	10 0 0	11 0 0	11 12 6	11 7 6	11 12 6	11 7 6	11 12 6
Bran .. .. do. ..	6 12 6	7 2 6	7 0 0	7 5 0	6 15 0	7 5 0	8 0 0	9 0 0	9 0 0	9 5 0	9 0 0	9 5 0
Pollard .. .. do. ..	6 10 0	7 2 6	7 5 0	7 10 0	6 17 6	7 5 0	8 5 0	9 3 0	9 5 0	9 10 0	9 0 0	9 10 0
FARM PRODUCE.												
Hay .. .. per ton ..	..	..	..	..	..	..	..	..	..	..	..	..
Chaff .. .. do. ..	2 0 0	4 7 6	3 0 0	4 2 6	2 10 0	4 0 0	3 10 0	4 10 0	3 10 0	4 12 6	3 10 0	5 7 6
Potatoes .. do. ..	6 10 0	9 10 0	6 0 0	10 0 0	4 0 0	13 10 0	6 0 0	13 0 0	8 10 0	11 0 0	8 0 0	11 0 0
Onions .. .. do. ..	5 0 0	7 10 0	6 0 0	8 0 0	7 0 0	8 5 0	7 0 0	9 0 0	8 10 0	11 0 0	8 10 0	11 0 0
Straw chaff .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
DAIRY PRODUCE.												
Butter, local .. per lb. ..	0 0 11	0 1 4	0 1 2	0 1 3	..	..	..	..	0 2 0	0 2 6	0 1 6	0 2 0
Bacon .. .. do. ..	..	..	..	..	0 0 11	0 0 11½	0 0 11	0 0 11½	0 0 11	0 0 11½	0 0 11	0 0 11½
Hams .. .. do. ..	..	..	..	..	0 1 2½	0 1 3	0 1 2½	0 1 3	0 1 2	0 1 3	0 1 2	0 1 4
Eggs .. .. per dozen ..	0 1 7	0 2 0	0 1 9	0 2 1	0 1 10	0 2 0	0 2 6	0 3 1	0 1 9	0 3 0	0 1 6	0 3 0
Cheese .. .. per lb. ..	..	..	..	..	0 0 8¾	0 0 9½	0 0 8¾	0 0 9½	0 0 8¾	0 0 9½	0 0 9½	0 0 9¾
Lard .. .. do. ..	..	..	..	..	..	0 0 10	..	0 0 10	..	0 0 10	..	..
Pork .. .. do. ..	..	..	..	..	0 0 6	0 0 6½	0 0 4	0 0 6½	0 0 3½	0 0 6	0 0 6½	0 0 7
POULTRY.												
Fowls .. .. per pair ..	0 6 0	0 7 6	0 5 0	0 7 0	0 4 6	0 7 0	0 4 6	0 7 6	0 4 0	0 7 6	0 3 6	0 7 0
Ducks .. .. do. ..	0 6 0	0 7 6	0 5 6	0 6 9	0 4 6	0 6 6	0 5 0	0 6 9	0 5 0	0 9 6	0 6 6	0 9 6
Geese .. .. do. ..	0 12 0	0 15 6	..	..	..	..	0 11 0	0 11 6	..	..	..	..
Turkeys, Gobblers do. ..	1 2 0	1 10 0	..	..	1 0 0	1 1 0	0 18 0	1 1 0	..	0 17 6	0 18 0	1 2 0
Turkeys, Hens do. ..	0 10 0	0 14 6	..	..	0 10 0	0 12 0	0 10 0	0 13 0	0 10 0	0 13 0	0 9 0	0 13 0
Pigeons .. .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
FRUIT.												
Apples .. .. per case ..	0 7 6	1 1 0	0 3 6	0 19 0	0 5 0	1 0 0	0 5 0	0 18 0	0 7 6	0 15 0	0 7 6	0 17 0
Apples, cooking do. ..	0 2 6	0 12 6	0 5 0	0 9 0	0 5 0	0 8 0	..	..	0 7 6	0 9 0	0 7 6	0 9 0
Apricots .. do. ..	0 12 0	1 6 0	..	1 0 0	..	..	..	..	..	..	..	..
Bananas .. do. ..	0 12 0	1 5 0	0 4 0	0 14 0	..	..	0 5 0	1 1 0	..	..	..	..
Cherries .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Cape Gooseberries per lb. .	0 0 2½	0 0 3	..	..	..	..	..	0 0 4	..	..	..	..
Figs .. .. per case ..	0 4 6	0 13 6	0 3 0	0 16 0	0 1 6	0 8 0	0 2 6	0 9 0	0 2 6	0 4 6	..	..
Grapes .. .. do. ..	0 3 6	0 11 0	0 3 6	0 10 0	0 4 6	0 14 0	0 4 6	0 16 0	0 3 6	0 9 0	..	..

...ly Wholesale Prices at Perth of the principal kinds of Agricultural, Orchard, and Farmyard Produce during 1902.—contd.

Description of Produce.	January.		February.		March.		April.		May.		June.	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max	Min.	Max.	Min.	Max.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d	£ s. d.
Lemons, local .. per case ..	0 2 6	0 8 0	0 4 6	0 6 0	0 6 0	0 10 6	0 6 0	0 7 0	..	..	0 3 0	0 15 0
Lemons, imported do. ..	0 18 0	1 2 0	0 12 0	0 15 0	0 13 0	1 7 6	1 1 6	1 13 0	..	..	..	..
Loquats .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Mandarins .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Nectarines .. do. ..	0 12 6	1 0 0	0 5 0	0 19 0	..	..	..	..	..	..	..	..
Oranges, local .. do. ..	..	..	..	..	..	..	..	0 6 0	0 10 0	0 15 0	0 4 0	0 12 0
Oranges, imported do. ..	0 19 0	1 3 0	0 14 0	0 18 0	0 19 0	1 10 0	1 2 0	1 4 0	..	..	..	..
Pears, Eating .. do. ..	0 3 0	1 0 0	0 5 0	0 18 0	0 10 0	0 19 6	0 5 0	1 4 0	0 7 6	1 5 0	0 7 6	0 17 6
Pears, Cooking .. do. ..	0 5 0	0 11 0	0 3 0	0 6 0	..	..	0 4 0	0 5 6	..	..	..	..
Peaches .. .. do. ..	0 3 6	1 0 0	0 8 0	1 0 0	0 5 0	1 1 0	0 5 0	1 3 0	..	..	..	..
Plums .. .. do. ..	0 7 6	0 14 0	0 10 6	0 15 0	0 12 0	1 0 0	0 12 0	1 2 0	..	..	..	..
Passion Fruit .. do. ..	0 9 0	0 17 0	0 5 0	0 10 0	0 6 0	0 18 0	..	..	..	..	..	..
Quinces .. do. ..	..	..	0 4 0	0 7 0	0 3 0	0 6 6	0 3 6	0 7 0	0 5 6	0 9 0	..	..
Strawberries .. per lb. ..	..	..	..	..	..	..	..	..	..	..	..	..
Persimmons .. per case ..	..	..	..	..	..	..	0 4 0	0 7 6	0 4 6	0 12 0	0 6 6	0 12 0
Gooseberries .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Cherry Plums .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
VEGETABLES.												
Beans, Broad .. per lb. ..	..	..	..	..	..	..	..	..	..	..	..	..
Beans, French .. do. ..	0 0 1	0 0 2½	0 0 1	0 0 3½	0 0 1	0 0 2½	0 0 1	0 0 5	..	..	..	..
Beetroot .. per doz. bunches	0 0 9	0 1 9	0 0 9	0 2 0	0 2 0	0 2 9	0 1 0	0 2 0	..	..	..	..
Cabbage .. per cwt. ..	0 2 0	0 4 0	0 2 6	0 10 0	0 6 0	0 11 0	0 4 6	0 11 0	0 4 6	0 10 0	0 2 0	0 6 0
Cauliflower .. per dozen ..	..	..	..	..	..	..	..	..	..	..	0 2 0	0 9 0
Carrots .. per doz. bunches	0 0 4	0 1 3	0 0 6	0 1 9	0 1 0	0 2 0	0 1 0	0 2 0	0 1 0	0 1 6	0 1 0	0 1 9
Celery .. .. per doz. heads	0 1 0	0 2 6	0 1 0	0 1 6	0 1 0	0 3 0	0 1 0	0 3 0	..	..	..	..
Cucumbers .. per dozen ..	0 1 0	0 2 6	0 0 9	0 2 0	0 1 0	0 3 0	0 1 6	0 3 6	..	..	..	..
Lettuces .. do. ..	0 0 2	0 0 5	0 0 2	0 0 4	0 0 9	0 0 10	0 0 6	0 1 0	..	..	..	..
Marrows .. do. ..	..	..	0 2 6	0 3 6	0 1 6	0 3 6	0 2 6	0 4 6	..	..	..	..
Melons, Rock .. do. ..	0 5 0	0 12 6	0 3 0	0 8 0	0 1 0	0 5 6	0 1 0	0 8 0	..	..	..	..
Melons, Water .. do. ..	0 6 0	1 8 0	0 4 0	1 0 0	0 1 6	0 12 0	0 2 0	0 8 0	..	..	..	..
Pumpkin .. per cwt. ..	0 4 0	0 9 0	0 3 0	0 7 6	0 3 0	0 10 0	0 3 0	0 5 6	0 3 0	0 5 0	0 4 0	0 6 6
Peas, Green .. per lb. ..	0 0 1½	0 0 3	0 0 3	0 0 3½	0 0 1½	0 0 5	0 0 2	0 0 6	0 0 2	0 0 3	..	..
Parsnips .. per doz. bunches	0 0 6	0 1 6	0 0 6	0 1 6	0 1 0	0 2 6	0 1 0	0 1 9	0 1 0	0 1 3	0 1 0	0 1 3
Rhubarb .. per lb. ..	0 0 1	0 0 2½	0 0 1½	0 0 1½	0 0 1	0 0 2	0 0 1	0 0 4	0 0 1½	0 0 2	0 0 1½	0 0 2
Spring Onions .. per doz. bunches	..	..	..	..	0 0 6	0 0 9	0 0 9	0 1 0	0 0 6	0 1 0	0 0 7	0 0 8
Tomatoes .. per case ..	0 2 0	0 8 0	0 1 0	0 5 0	0 2 0	0 6 6	0 2 0	0 6 0	0 2 0	0 6 0	0 2 0	0 6 0
Turnips .. per doz. bunches	0 0 6	0 1 0	0 0 9	0 2 1	0 1 0	0 3 0	0 0 6	0 2 0	..	..	..	..
Turnips, Swede .. per cwt. ..	..	..	0 6 0	0 10 0	0 6 0	0 6 3	0 8 0	0 10 0	..	..	..	..
Asparagus .. per doz. bunches	0 5 0	0 7 6	..	..	..	..	..	..	..	..	..	..
Artichokes .. per lb. ..	..	0 0 3	..	..	..	..	..	0 0 5	..	..	..	..
Egg Fruit .. per dozen ..	..	..	..	..	0 1 6	0 1 6	0 0 9	0 1 6	..	..	..	..
Sweet Potatoes .. per lb. ..	..	..	..	..	..	..	..	0 0 8	..	..	..	..

Monthly Wholesale Prices at Perth of the principal kinds of Agricultural, Orchard, and Farmyard Produce during 1902—contd.

Description of Produce.	July.						August.						September.						October.						November.						December.					
	Min.			Max.			Min.			Max.			Min.			Max.			Min.			Max.			Min.			Max.			Min.			Max.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Grain.																																				
Wheat .. .. per bushel ..	0	5	8	0	6	6	0	5	0	0	5	3	0	5	9	0	6	0	0	6	2	0	6	7	0	6	3	0	6	7	0	6	4	0	6	7
Oats .. .. do. ..	0	4	4	0	4	9	0	4	4	0	4	9	0	4	4	0	4	6	0	4	2	0	4	6	0	4	0	0	4	7	0	3	11	0	4	7
Barley .. .. do. ..		..			..			..			..			..			..			..			..			..			..		0	3	9	0	5	2
Maize .. .. do. ..		..		0	6	0		..			..			..			..		0	7	0	0	8	0	0	7	0	0	8	0	0	7	6	0	8	0
Mill Produce.																																				
Flour .. .. per ton ..	11	0	0	12	5	0	11	12	6	11	17	6	11	17	6	12	2	6	11	17	6	12	2	6	12	0	0	12	17	6	13	0	0	14	10	0
Bran .. .. do ..	8	15	0	9	10	0	9	0	0	10	0	0	10	13	0	11	0	0	10	5	0	10	17	6	10	5	0	11	0	0	11	10	0	11	15	0
Pollard .. .. do. ..	8	15	0	9	10	0	9	5	0	11	0	0	10	15	0	11	0	0	10	5	0	10	15	0	10	5	0	11	0	0	11	10	0	11	15	0
Farm Produce.																																				
Hay .. .. per ton ..		..			..			..			..			..			..			..			..			..			..			..			..	
Chaff .. .. do. ..	4	15	0	5	10	0	4	15	0	5	15	0	5	0	0	8	0	0	4	10	0	6	15	0	4	0	0	7	0	0	4	0	0	7	5	0
Potatoes .. do ..	8	0	0	11	0	0	9	0	0	12	0	0	8	10	0	17	10	0	9	10	0	16	0	0	7	0	0	19	0	0	5	10	0	8	15	0
Onions .. .. do. ..	9	0	0	11	0	0	10	0	0	11	0	0	10	0	0	11	0	0	10	0	0	11	10	0	7	0	0	10	0	0	5	10	0	10	0	0
Straw chaff .. do. ..	3	10	0	3	12	6		..			..		3	12	6	3	17	6		..			..			..			..			..			..	
Dairy Produce.																																				
Butter, local .. per lb. ..		..			..		0	1	8	0	2	0	0	1	6	0	2	0	0	1	2	0	1	8	0	1	3	0	1	4	0	1	2	0	1	4
Bacon .. .. do. ..	0	0	10½	0	0	11½	0	0	10½	0	0	11½	0	1	0	0	1	1½		..			..			..			..		0	0	11½	0	1	3
Hams .. do. ..	0	0	9	0	1	3½	0	0	9	0	1	3	0	1	0	0	1	4		..			..			..			..		0	1	2	0	1	4½
Eggs .. .. per dozen ..	0	1	9	0	2	0	0	1	7	0	1	10	0	1	0	0	1	2	0	1	2	0	1	7	0	1	2	0	1	6	0	1	4	0	1	9
Cheese .. .. per lb. ..	0	0	9	0	0	9½		..			..			..			..			..			..		0	0	9½	0	0	11½	0	0	10	0	1	0
Lard .. .. do. ..		..		0	0	10½	0	0	9½	0	0	10		..			..			..			..			..			..			..			..	
Pork .. .. do. ..	0	0	6	0	0	7½	0	0	5½	0	0	7		..			..			..			..		0	0	6½	0	0	8	0	0	6½	0	0	7½
Poultry.																																				
Fowls .. .. per pair ..	0	4	0	0	7	3	0	4	0	0	7	6	0	4	0	0	8	0	0	5	0	0	7	6	0	5	0	0	7	6	0	4	6	0	7	3
Ducks .. .. do. ..	0	6	0	0	9	6	0	9	0	0	11	6	0	8	6	0	12	0	0	8	0	0	9	6	0	7	3	0	9	3	0	5	6	0	8	0
Geese .. .. do. ..		..		0	12	0		..		0	13	0		..			..			..		0	15	0	0	15	0	0	17	6	0	14	0	0	17	6
Turkeys, Gobblers do. ..	0	18	0	1	10	0	0	13	0	1	1	0	1	1	0	1	6	0	1	8	0	1	10	0	1	2	0	1	12	0	1	8	0	1	13	0
Turkeys, Hens do. ..	0	9	0	0	13	0		..			..		0	10	0	0	14	0	0	10	0	0	15	0	0	12	0	0	17	0	0	12	6	0	17	0
Pigeons .. . do. ..		..			..			..			..			..			..			..			..		0	1	6	0	2	3	0	1	6	0	2	3
Fruit.																																				
Apples .. .. per case ..	0	8	0	1	1	6	0	10	6	1	18	0	0	10	0	1	10	0	0	17	0	1	15	0	1	0	0	1	16	0	0	17	6	2	0	0
Apples, cooking do. ..		..			..			..			..			..			..		0	10	0	0	16	0	0	17	0	0	19	0		..			..	
Apricots .. do. ..		..			..			..			..			..			..			..			..		1	10	0	1	15	0	0	14	0	1	18	0
Bananas .. do. ..	0	8	0	0	18	0	0	18	0	1	2	6		..			..		0	10	0	0	14	0	0	10	0	1	3	0	0	8	6	1	5	0
Cherries .. do. ..		..			..			..			..			..			..			..			..		1	5	0	1	10	0	1	0	0	1	10	0
Cape Gooseberries per lb. ..		..			..			..		0	0	4	0	0	4	0	0	5	0	0	4½	0	0	5½	0	0	4½	0	0	7½	0	0	4½	0	0	5½
Figs .. .. per case ..		..			..			..			..			..			..			..			..			..			..		0	15	0	1	5	0
Grapes .. .. do. ..		..			..			..			..			..			..			..			..			..			..			..			..	

Monthly Wholesale Prices at Perth of the principal kinds of Agricultural, Orchard, and Farmyard Produce during 1902—contd.

Description of Produce.	July		August		September		October		November		December	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Lemons, local .. per case ..	0 5 0	0 9 0	0 5 0	0 8 0	0 5 0	0 9 6	0 8 6	0 15 6	0 8 6	0 14 0	0 7 6	0 11 0
Lemons, imported do. ..	..	..	..	..	..	..	..	..	1 8 0	1 10 0	1 1 0	1 9 0
Loquats .. do. ..	..	..	..	..	..	..	0 6 0	0 10 6	0 6 0	1 0 0	0 8 0	1 0 0
Mandarins .. do. ..	0 10 0	0 16 0	0 12 6	0 17 0	0 16 0	1 0 0	..	..	.	..	..	..
Nectarines .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Oranges, local .. do. ..	0 5 0	0 9 6	0 6 0	0 14 6	0 12 0	1 0 6	0 10 0	1 2 6	0 14 0	1 5 0	0 14 0	2 0 0
Oranges, imported do. ..	..	..	..	..	..	..	..	..	1 8 0	1 10 0	0 14 0	1 5 0
Pears, Eating .. do. ..	..	..	..	..	..	..	..	..	..	..	0 12 6	1 2 0
Pears, Cooking .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Peaches .. .. do. ..	..	..	..	..	..	..	..	..	..	..	0 14 0	1 10 0
Plums .. .. do. ..	..	..	..	..	..	..	..	..	..	..	0 17 0	0 17 6
Passion Fruit .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Quinces .. .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Strawberries .. per lb. ..	..	..	..	..	..	..	0 0 7	0 1 3	0 0 6	0 1 0	0 0 7½	0 0 11
Persimmons .. per case ..	..	..	..	..	..	..	..	..	..	..	..	..
Gooseberries .. per lb. ..	..	..	..	..	..	..	..	..	0 0 2½	0 0 3	0 6 0	0 16 0
Cherry Plums .. per case ..	..	..	..	..	..	..	..	..	..	..	0 14 0	1 5 0
VEGETABLES.												
Beans, Broad .. per lb. ..	..	..	..	..	..	..	0 0 1	0 0 1½	0 0 1	0 0 2	0 0 0½	0 0 1
Beans, French .. do. ..	..	..	..	..	..	..	..	..	0 0 2	0 0 2½	0 0 0¾	0 0 2¼
Beetroot .. per doz. bunches	0 1 3	0 2 3	0 2 3	0 3 6	..	..	0 0 9	0 1 10	0 1 0	0 2 0	0 1 0	0 1 9
Cabbage .. per cwt. ..	0 1 6	0 2 6	0 2 6	0 4 6	0 3 0	0 7 6	0 2 6	0 5 0	0 2 0	0 5 0	0 2 0	0 5 0
Cauliflower .. per dozen ..	0 1 6	0 9 0	0 2 0	0 6 6	0 1 6	0 6 0	0 1 6	0 3 9	0 1 6	0 3 9	0 2 0	0 4 0
Carrots .. per doz. bunches	0 2 6	0 3 3	0 2 6	0 3 6	..	..	0 0 9	0 1 0	0 0 8	0 1 0	0 0 6	0 1 0
Celery .. .. per doz. heads	0 0 9	0 2 6	0 1 6	0 2 6	..	..	0 2 6	0 3 0	0 2 0	0 2 9	0 1 9	0 3 0
Cucumbers .. per dozen ..	..	..	..	..	..	..	..	..	0 4 6	0 6 0	0 1 3	0 3 6
Lettuces .. do. ..	0 0 3	0 0 6	0 0 3	0 0 9	..	..	0 0 9	0 1 0	0 0 2	0 0 8	0 0 3	0 0 9
Marrows .. do. ..	..	..	..	..	..	..	..	..	0 1 9	0 3 6	0 1 6	0 3 0
Melons, Rock .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Melons, Water .. do. ..	..	..	..	..	..	..	..	..	..	..	..	..
Pumpkin .. per cwt. ..	0 3 6	0 6 0	0 6 0	0 10 0	0 10 6	0 13 6	..	..	0 7 0	0 8 6	0 7 0	0 13 0
Peas, Green .. per lb. ..	..	..	..	..	0 0 2	0 0 5	0 0 1	0 0 3¾	0 0 0¾	0 0 2	0 0 0¾	0 0 2
Parsnips .. per doz. bunches	..	..	0 2 6	0 3 6	..	..	0 1 3	0 1 9	0 1 0	0 1 9	0 3 0	0 2 0
Rhubarb .. per lb. ..	0 0 1	0 0 2	0 0 2	0 0 3	0 0 2	0 0 3	0 0 2	0 0 3	0 0 1½	0 0 2½	0 0 1½	0 0 2
Spring Onions .. per doz. bunches	0 0 3	0 0 6	0 0 9	0 1 3	..	..	..	..	..	..	..	..
Tomatoes .. per case ..	0 3 6	0 6 0	..	..	..	..	..	..	0 6 0	0 16 6	0 6 0	0 17 0
Turnips .. .. per doz. bunches	0 0 4	0 0 6	0 0 9	0 1 6	0 0 8	0 1 6	0 0 4	0 0 6	0 0 6	0 1 0	0 0 6	0 1 3
Turnips, Swede .. per cwt. ..	0 5 0	0 6 6	0 6 0	0 9 0	0 4 0	0 10 0	0 1 6	0 3 0	0 2 0	0 4 0	0 2 0	0 4 0
Asparagus .. per doz. bunches	..	..	..	..	..	..	..	..	..	..	..	..
Artichokes .. per lb. ..	..	..	..	..	..	..	..	..	..	..	..	..
Egg Fruit .. per dozen ..	..	..	..	..	..	..	..	..	..	..	..	..
Sweet Potatoes .. per lb. ..	..	..	..	..	..	..	..	..	..	..	..	..

9.—NEWSPAPERS.

The State is well supplied with newspapers, many of which are of a very high standard. The following is a list prepared by the Librarian of the Victoria Public Library, Perth, those included being newspapers in course of publication on the 31st December, 1903, and copies of which had been received at the Library :—

No.	Name.	Where Published.	When Published.	Price.
1	Albany Advertiser	Albany	Wed. and Sat. ..	1d.
2	Bunbury Herald	Bunbury	Mon., Wed., and Sat.	1d.
3	Civil Service Journal ..	Perth	Monthly	a
4	Collie Miner	Collie	Saturday	1d.
5	Commercial	Fremantle ..	Monthly	6d.
6	Coolgardie Miner	Coolgardie ..	Daily	1d.
7	Daily News	Perth	Daily	1d.
8	Day Dawn Chronicle ..	Day Dawn ..	Wednesday	3d.
9	East Murchison News ..	Lawlers	Friday	6d.
10	Eastern Districts Chronicle	York	Saturday	3d.
11	Education Circular ..	Perth	Monthly	Free (official)
12	Evening Star	Boulder	Daily	1d.
13	Fremantle Mail	Fremantle ..	Tues., Thurs., & Sat.	1d.
14	Geraldton Advertiser ..	Geraldton ..	Mon., Wed., Fri., ..	2d.
15	Geraldton Express and Murchison and Yalgoo Goldfields Chronicle	Geraldton ..	Friday	6d.
16	Government Gazette ..	Perth	Friday	5s. per an.
17	Great Southern Herald ..	Katanning ..	Saturday	3d.
18	Guardian	Claremont ..	Saturday	1d.
19	Journal of the Department of Agriculture	Perth	Monthly	3d.
20	Kalgoorlie Miner	Kalgoorlie ..	Daily	1d.
21	Kookynie Advocate ..	Kookynie ..	Wed. and Sat. ..	2d.
22	Kookynie Press	Kookynie ..	Saturday	3d.
23	Malcolm Chronicle ..	Malcolm ..	Friday	3d.
24	Morgans and Laverton Mercury	Laverton	Friday	3d.
25	Morning Herald	Perth	Daily	1d.
26	Mount Leonora Miner ..	Mount Leonora ..	Saturday	3d.
27	Mount Magnet Miner ..	Mount Magnet ..	Saturday	3d.
28	Murchison Advocate ..	Cue	Saturday	3d.
29	Murchison Times and Day Dawn Gazette	Cue	Tues. Thurs., & Sat.	3d.
30	Norrogin Advocate ..	Narrogin	Wednesday .. .	3d.
31	Newcastle Herald	Newcastle ..	Saturday	3d.
32	Norseman Times	Norseman ..	Tues. and Fri. ..	3d.
33	North Coolgardie Herald	Menzies	Daily	2d.
34	Northam Advertiser ..	Northam ..	Wed. and Sat. ..	2d.
35	Pilbarra Goldfields News	Marble Bar ..	Saturday	6d.
36	School Paper	Perth	Monthly	1d.
37	Southern Cross Times ..	Southern Cross ..	Saturday	2d.
38	Southern Times	Bunbury ..	Tues., Thurs., & Sat.	1d.
39	Spectator	Perth ..	Thursday	3d.
40	Sun	Kalgoorlie ..	Sunday	3d.
41	Sunday Times	Perth	Sunday	3d.
42	Swan Express	Midland Junction	Saturday	1d.
43	Taxation	Kalgoorlie ..	Monthly	1d.
44	Truth*	Perth	Saturday	3d.
45	W.A. Baptist Monthly ..	Perth	Monthly	1d.
46	W.A. Record	Perth	Saturday	3d.
47	West Australian	Perth	Daily	1d.
48	West Australian Church News	Perth	Monthly	3d.
49	West Australian Fanciers' Journal	Perth	Monthly	6d.
50	West Australian Freemason	Perth	Monthly	6d.
51	West Australian Mining, Building, and Engineering Journal	Perth	Saturday	6d.
52	Western Argus	Kalgoorlie ..	Tuesday	6d.
53	Western Australian Racing Calendar	Perth	Monthly	6d.
54	Western Australian Railway Gazette	Perth	Monthly	1d.
55	Western Mail	Perth	Saturday	6d.
56	Western Temperance News	Perth	Monthly	1d.
57	Westralian Worker ..	Kalgoorlie ..	Friday	1d.

a Issued to members of the Civil Service Association. *This is published Melbourne, but contains a supplement which is published in Perth.

Digitized by Google

During the preceding year, 16 newspapers ceased publication, whilst 18 new ones were started. The number existing at the end of the year was 57. The number for which each of the various towns possessing newspapers was responsible may be seen hereunder.

Town.	When issued.					
	Daily.	Three times a week.	Twice a week.	Weekly.	Monthly.	Total.
Albany	..	..	1	..	..	1
Boulder	1	..	..	..	..	1
Bunbury	..	2	..	..	..	2
Claremont	..	..	..	1	..	1
Collie	..	..	..	1	..	1
Coolgardie	1	..	..	..	..	1
Cue	..	1	..	1	..	2
Day Dawn	..	..	..	1	..	1
Fremantle	..	1	..	..	1	2
Geraldton	..	1	..	1	..	2
Kalgoorlie	1	..	..	3	1	5
Katanning	..	..	..	1	..	1
Kookynie	..	..	1	1	..	2
Laverton	..	..	..	1	..	1
Lawlers	..	..	..	1	..	1
Malcolm	..	..	..	1	..	1
Marble Bar	..	..	..	1	..	1
Menzies	1	..	..	..	..	1
Midland Junction ..	..	..	..	1	..	1
Mount Leonora	..	..	..	1	..	1
Mount Magnet	..	..	..	1	..	1
Narrogin	..	..	..	1	..	1
Newcastle	..	..	..	1	..	1
Norseman	..	..	1	..	..	1
Northam	..	..	1	..	..	1
Perth	3	..	..	7	11	21
Southern Cross	..	..	..	1	..	1
York	..	..	..	1	..	1
Total	7	5	4	28	13	57

The increase in the number of Western Australian publications during the past decade is shown by the following figures:—

Year.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.
Number	21	26	33	48	39	41	50	53	55	57

Digitized by Google

10.—PUBLIC HOLIDAYS.

Civil Service Holidays.

New Year's Day	January 1
Good Friday.	
Easter Eve.	
Easter Monday.	
Foundation of the Colony	June 1*
Proclamation Day	October 21*
King's Birthday	November 9*
Christmas Day	December 25
Boxing Day	December 26

Bank Holidays

Good Friday.	*3rd June (Prince of Wales' Birthday)
Easter Eve.	*9th August (Coronation Day).
Easter Monday.	*21st October.
New Year's Day.	*9th November.
*26th Jan (Australian Anniversary)	Christmas Day.
*1st June.	26th December

*Whenever any of these holidays falls upon a day other than a Monday, the following Monday is observed as a holiday instead of such day.

The Governor has power to proclaim any special day as a bank holiday.

Part VII.—MISCELLANEOUS.

1.—SHIPPING FACILITIES.

(Particulars furnished by the various Shipping Companies.)

The shipping facilities possessed by Western Australia are considerable, when the comparatively small population of the State is taken into consideration.

The following are the principal companies connected with the shipping trade and their present ruling passage and freight rates. These rates, however, it must be stated, are liable in every instance to alteration at any time as circumstances may seem to require :—

Peninsular and Oriental S.N. Company.

The mail steamers of the Peninsular and Oriental S.N. Company, both homeward and outward bound, call in fortnightly at Fremantle.

Agents, Perth and Fremantle, J. M. Mare ; Sub-Agents : Kalgoorlie, Hocking & Co. ; Coolgardie, Whitby & Co. ; Geraldton, Burns, Philp, & Co.

Digitized by Google

Rates of Passage Money from Fremantle.

To	First Saloon.			Second Saloon.		
	Single Passage.	Return.		Single Passage.	Return.	
Adelaide	£9	£13 10s.	Available for 6 months.	£7	£10 10s.	Available for 6 months.
Melbourne	£12	£18		£9	£13 10s.	
Sydney	£14	£21		£11	£16 10s.	
Colombo	£30	£45	Available for 24 months.	£23	£34	Available for 24 months.
Bombay and Calcutta ..	£33	£49		£25	£37	
Penang and Singapore ..	£49	£73		£27 and £30	£45	
Hong Kong	£60	£90		£38	£57	
Shanghai	£66	£99		£41	£61	
Nagasaki, Kobe, Yokohama	£66	£99		£41	£61	
Aden	£44	£66		£30	£45	
Port Said	£69‡	£103		£34 £36 £40	£60	
*Brindisi, Marseilles ..	£71‡	£107		£35 £37 £41	£61	
Malta, Gibraltar ..	£71‡	£107		£35 £37 £41	£61	
London	£77‡	£115		£38 £41 £44	£66	

*Only first saloon passengers are conveyed by the express steamers "Isis" and "Osiris" between Port Said and Brindisi; second saloon passengers, therefore, travelling to Brindisi have to pay an additional £4 to the above Marseilles fare each way. ‡ There are a limited number of berths, for which the charge is from £5 to £11 less. Passengers are booked through to London, overland *via* Marseilles or *via* Brindisi, for full particulars in regard to which see Company's Australian Handbook.

Return Tickets to Europe.

To Brindisi, Marseilles, Malta, or Gibraltar.		To or from London by sea or rail between Marseilles and London both ways.	
First Saloon.	Second Saloon.	First Saloon.	Second Saloon.
£107	£61	£115	£66

The above return tickets are available for 24 months from date of departure to arrival on return.

Round the World Tours.

Passengers can be booked round the world from Australian ports touched at by the Company's steamers, *via* London, Liverpool, New York, San Francisco, Honolulu, and Auckland, first saloon, £130.

Through tickets round the world *via* Vancouver, in conjunction with the Canadian-Australian Company, £130, and Canadian-Pacific Line *via* China, Japan, and Chicago, £157 10s.

These vessels do not carry Interstate cargo,

Digitized by Google

The Orient S.N. Company.

The mail steamers of the Orient Pacific line visit Fremantle on alternate weeks to those of the P. & O. Manager for Western Australia, Thomas Day, O.S.N. Co., Limited, Perth and Fremantle; T. Stodart & Co., Kalgoorlie.

Passage Money to and from London.

First Saloon	£66 to £77
Second do.	£38, £41, £44.
Third do.	£17, £19, £21.
Return Tickets	£66 to £115
Cargo Rates from London ..	about 70s. per ton.

Freight from Fremantle to London.

General and Rough Goods ..	30s. to 45s. per ton.
Wool (greasy)	about 0½d. to 0¾d. per lb.
Do. (washed)..	

Through cargo at special rates from *London* to North-West ports is accepted on a through bill of lading, said cargo being transshipped into coastal steamers at Fremantle. Cargo is also accepted through to Perth, Bunbury, Geraldton, and Albany.

Freights from London to Fremantle.

Cargo Rates .. .. about 70s. per ton.

Interstate Passenger Fares.

	From Fremantle.	
	£ s. d.	£ s. d.
	1st Class.	Return.
To Adelaide	9 0 0	13 10 0
Melbourne	12 0 0	18 0 0
Sydney	14 0 0	21 0 0
	2nd Class.	Return.
Adelaide	7 0 0	10 10 0
Melbourne	9 0 0	13 10 0
Sydney	11 0 0	16 10 0
	3rd Class.	Return.
Adelaide	4 0 0	8 0 0
Melbourne	5 0 0	10 0 0
Sydney	6 0 0	12 0 0

These steamers do not carry Interstate cargo.

N.B.—All rates (passage and cargo) are liable to alteration at any time.

North German Lloyd.

The North German Lloyd Imperial mail steamers call at Fremantle every three weeks, outwards and homewards. On leaving Bremen, they call at Antwerp, Southampton, Genoa, Naples, Port Said, Suez, Aden, and Colombo. Homeward, same ports.

Single fares homewards, from £15 to £77.
Return fares homewards, from £27 to £115.

Digitized by Google

Fares to the Eastern States.

	1st Class.			2nd Class.			3rd Class.		
	£	s.	d.	£	s.	d.	£	s.	d.
Adelaide single	9	0	0	7	0	0	4	0	0
" return	13	10	0	10	10	0	6	0	0
Melbourne, single	12	0	0	9	0	0	5	0	0
" return	18	0	0	13	10	0	7	10	0
Sydney, single	14	0	0	11	0	0	6	0	0
" return	21	0	0	16	10	0	9	0	0

First class interstate return tickets are interchangeable with the P. & O., Orient, and Messageries Maritimes lines.

Freight homewards, as per arrangement.

Cargo is accepted to Fremantle and also to Perth and Albany, on a through bill of lading, and forwarded by rail to Albany at cheap rates. Cargo is also taken to and from London, being transhipped at Bremen.

Australian Fleet.

			tons
Grosser Kurfurst	Twin Screw	..	13,182
Barbarossa	"	..	10,915
Königin Luise	"	..	10,711
Friedrich der Grosse	"	..	10,561
Bremen	"	..	11,570
Rhein	"	..	10,058
Main	"	..	10,057
Prinz Regent Luitpold	"	..	6,288
Neckar	"	..	9,835
Zieten	"	..	8,043
Gneisenau	"	..	7,500
Roon	"	..	8,022
Seydlitz	"	..	7,500
Scharnhorst	"	..	8,000
Darmstadt	"	..	5,012
Gera	"	..	5,005
Oldenburg	"	..	5,006
Weimar	"	..	4,986
Stuttgart	"	..	5,048
Karlsruhe	"	..	5,057

The first steamer of the company to call at Fremantle was the Prinz Regent Luitpold, in February, 1898.

The agents for the company in Western Australia are L. Ratani & Co., Mount Street, Fremantle.

MESSAGERIES MARITIMES COMPANY.

French Mail Steamers.

The steamers of the *Compagnie des Messageries Maritimes* call in at Fremantle every four weeks.

Agents.—Fremantle, Dalgety & Co., Ltd.; Albany, Dalgety & Co., Ltd.; Geraldton, Burns, Philp & Co.; Coolgardie, F. A. Davis; Kalgoorlie, F. A. Davis; Perth, Dalgety & Co., Ltd.; Bunbury, Dalgety & Co., Ltd.

Digitized by Google

Passage Money.

Between Fremantle and Marseilles, either way—

Single journey .. .. £22 to £71
Return do. (available for 24 months including in and outward passages) £33 to £107

Through ticket, Marseilles to London (24 hours by rail), 1st class, £5; 2nd class, £4; with the advantage to passengers of breaking their journey for a fortnight from Marseilles to London and *vice versa.*

Luggage is conveyed free by steamer from Marseilles to London.

The following steamers are engaged in the Australian trade:—

	tons (gross).	tons (net).
Armand Behic	.. 6,635	.. 2,819
Ville de la Ciotat	.. 6,631	.. 2,821
Dumbea	.. 5,876	.. 2,773
Nera	.. 5,823	.. 2,826
Sydney	.. 4,232	.. 2,077

Cargo Freights.

Between London and Fremantle, from 50s. to 80s. per ton, according to season.

Wool, from ½d. to ¾d. per lb.

Interstate Passage Rates per Messageries Maritimes Company.

	1st Saloon.		2nd Saloon.		3rd Class.	
	Single.	Return.	Single.	Return.	Single.	Return.
From Fremantle to—	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Adelaide ..	9 0 0	13 10 0	7 0 0	10 10 0	4 0 0	6 10 0
Melbourne ..	12 0 0	18 0 0	9 0 0	13 10 0	4 16 0	7 4 0
Sydney ..	14 0 0	21 0 0	11 0 0	16 10 0	6 4 0	9 6 0
Noumea ..	22 0 0	33 0 0	17 12 0	26 8 0	8 16 0	13 4 0

And *vice versa.*

The steamers of this line do not carry interstate cargo. Wine is supplied free to passengers. First-class passengers have also the right to certain drinks, such as grog, syrups, and lemonade, beer, marsala, sherry, and cognac.

The Messageries Maritimes Company have built special boats for the Australian service, of 7,000 h.p. each.

English stewards and English stewardess on every steamer. English interpreter on express train from Marseilles to London.

This company has made arrangements with the Canadian-Pacific Railway for the issue of all-round-the-world tickets. Rate, £130.

Route, Messageries Maritimes.—London, Marseilles, Port Said, Suez, Aden, Bombay, Colombo, Fremantle, Adelaide (on return passage only), Melbourne, Sydney, Noumea, and *vice versa.*

Digitized by Google

Canadian-Pacific Railway.—Sydney, Vancouver, Montreal, Quebec, St. John (N.B.), Halifax, Boston, or New York, Liverpool or Southampton, London, or *vice versa.*

For full particulars, apply to Dalgety & Company, Ltd., Fremantle and Perth, agents. Handbooks delivered free on request.

THE LIVERPOOL "WHITE STAR" LINE OF STEAMERS.

Agents in Australia, Dalgety & Co., Limited.

The following steamers are despatched, at advertised dates, from Sydney and Melbourne for Albany, Capetown, Plymouth, and London :—

Afric	11,948 tons
Medic	11,984 ,,
Persic	11,974 ,,
Runic	12,482 ,,
Suevic	12,500 ,,

Accommodation for one class of passengers only.

Schedule of Fares.

FROM SYDNEY OR MELBOURNE.	Each Adult.											
	LONDON.						CAPETOWN.					
	Single.			Return.			Single.			Return.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Two-berth outside rooms, upper deck, Runic and Suevic	27	0	0	48	12	0	23	2	0	41	11	8
Two-berth inside rooms, upper deck, Runic and Suevic	25	0	0	45	0	0	22	1	0	39	18	9
Two-berth outside rooms, main deck, all steamers	24	0	0	43	4	0	21	0	0	37	16	0
Two-berth inside rooms, main deck, all steamers	23	0	0	41	8	0	19	19	0	35	18	2
Four-berth outside rooms, main deck, all steamers	23	0	0	41	8	0	19	19	0	35	18	2
Four-berth inside rooms, main deck, all steamers	21	·	0	37	16	0	17	17	0	32	2	8
Six-berth inside rooms, main deck, Afric, Medic, and Persic	19	0	0	34	4	0	16	16	0	30	4	10
Eight and Ten-berth rooms, upper deck, all steamers (men only)	19	0	0	34	4	0	16	16	0	30	4	10

Through Bookings—New York.

Passengers can be booked from Australia to New York by way of Liverpool (the Atlantic voyage being made by the famous steamers of the White Star Line American service) at rates ranging from £25 2s. 6d. to £33 2s. 6d., according to accommodation selected in steamers of the colonial service.

These rates include rail journey from London to Liverpool, also forwarding from New York to Boston, Philadelphia, or Baltimore, free of extra cost.

Should it be desired, second class passage can be granted for the Liverpool-New York voyage (booking in Australia only between September and May), the through rates ranging from £27 upwards. In the case of second-class booking for the Atlantic voyage, forwarding is allowed from New York to Boston or Philadelphia, but not to Baltimore.

Digitized by Google

THE "ABERDEEN" LINE OF STEAMERS.

London via Port Natal and Capetown.

The following full-powered steamers are despatched from Port Melbourne, at advertised dates, for Albany, Port Natal, Capetown, Teneriffe, Plymouth, and London :—

Sophocles	4,748 tons.
Moravian	4,573 „
Salamis	4,508 „
Nineveh	3,808 „
Australasian	3,661 „
Aberdeen	3,659 „
Damascus	3,609 „

These steamers carry H.M. mails between South Africa and Australia.

Only first and third-class passengers are carried.

Agents in Australia: Dalgety & Co., Ltd. Owners: George Thompson & Co., London and Aberdeen.

Fares from Sydney, Melbourne, Adelaide, Launceston, and Hobart.

SALOON.

	Single.	Return.
To Durban and Capetown	£31 10 0	£55 2 6
To Plymouth or London	£55 0 0	£92 0 0

THIRD CLASS.

	To Durban and Capetown.		To Plymouth or London.	
	Single.	Return.	Single.	Return.
In two-berth cabin ..	£17 17 0	£28 15 5	£20 0 0	£36 0 0
In four-berth cabin ..	15 15 0	26 13 5	18 0 0	32 8 0
Open berths, men ..	13 13 0	24 11 5	16 0 0	28 16 0
Open berths, women, in Salamis, Moravian, and Sophocles only ..	13 13 0	24 11 5	16 0 0	28 16 0

THE WEST AUSTRALIAN STEAM NAVIGATION COMPANY, LIMITED, AND THE OCEAN STEAMSHIP COMPANY, LIMITED.

The London agents for the above company are—Messrs. Bethell, Gwyn, & Co., of 22 Billiter Street, E.C., and Trinder, Anderson, & Co., of Leadenhall Chambers, St. Mary Axe; Liverpool, Alfred Holt & Co.

Agents in Western Australia—Messrs. Dalgety & Co., Limited, Perth, Fremantle, Albany, Geraldton, Carnarvon, Cossack, and Port Hedland; Onslow, J. Clark & Co.; Broome, Streeter & Co.; Derby, Adcock Bros. & Co.

These Companies have four first-class vessels—the s.s. "Charon;" the s.s. "Paroo," 1,718 tons net register (2,665 tons gross); the s.s. "Sultan," 1,270 tons net register (2,062 tons gross); and the s.s. "Minilya," 1,712 tons net register (2,744 tons gross). These vessels, which have been specially designed and constructed for this trade, combining passenger accommodation equal to that of an ocean mail steamer with the light draft necessary to enable them to approach the coastal ports, carry out a fortnightly service between Fremantle and Singapore, touching at the usual intermediate ports. At Singapore they connect with the P. & O. Co's. steamers

Digitized by Google

passengers, and with Holt's Ocean Line of steamers for cargo, which leave there for London, etc., about twice a week. The average duration of the voyage between Fremantle and Singapore is 20 days, and from Singapore to London 30 to 35 days.

Cargo is booked by this route, not only between London and Western Australia, but also between Western Australia and all the chief ports on the European Continent, Glasgow, Liverpool, New York, Philadelphia, Boston, etc.; also to and from India, China, Japan, etc.

Steamers leaving London, Liverpool, Glasgow, Antwerp, Hamburg, and other Continental ports (at intervals of about 15 days); steamers from New York, Vancouver, principal Indian, Chinese, and Japanese ports, connect regularly with the vessels of this line at Singapore. Goods are received at through rates for Western Australia at all the before-mentioned ports and forwarded to any Western Australian port on a through bill of lading. The same system of traffic is also available for exports from Western Australia.

Passengers for London are transhipped into the P. & O. steamers at Singapore.

The passage money between London and all ports *via* Singapore is £62 saloon, and £41 saloon in steamers between Singapore and Western Australia, and second class in P. & O. steamers; return saloon, £110. Return saloon (Western Australia *via* Singapore steamer) and second saloon in P. & O., £70.

Children under 12 years	.. ..	Half fare
One child ,, 3 ,,	.. ..	Free.

The rates of freights to Fremantle *via* Singapore are—

From London—Weight, 30s. to 35s. per ton.
Rough measurement, 50s. per ton.
Fine measurement, 55s. per ton.

From Liverpool and Glasgow—Weight, 32s. 6d. to 37s. 6d.
Measurement, 50s. to 55s. per ton.

From Hamburg, Antwerp, Rotterdam, and Bremen—
Weight, 27s. 6d. to 35s. per ton.
Measurement, 50s. to 55s. per ton

New York-Fremantle.—Through bills of ading to Fremantle by steamer from New York are given by Booth & Co., 90 Gold Street, New York, goods being transferred in Singapore to the Western Australian steamers.

From New York.—Weight or measurement, about 40s. per ton. The rates of freight to the Northern ports of Western Australia from all European ports are a little in excess of the Fremantle rates.

These companies have a small steamer, the "Beagle," connecting with the larger boats at Cossack, and carrying passengers and cargo to and from London and the various landing places for stations and the goldfields adjacent to Cossack.

Digitized by Google

W.A. Steam Navigation Company, Limited, and the Ocean Steamship Company, Limited.

*Rates of Passage Money and Freights.

Ports.	Passengers.				Stock.			Cargo.				
					Less 10 per cent. if more than 10 head. Ten head and over a free steerage passage to man in charge.		Less 10 per cent. for 25 Rams and over.					
	1st Class.	Return.	2nd Class.	Natives and Asiatics on Deck.	Horses.	Stud Cattle.	Rams or Stud Sheep.	General.	Tobacco, Cigars, Wine and Spirits.	Timber. Per load, 50 cu. ft.	Hay and Chaff. Per ton weight.	Parcels.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	Per ton. s. d.	Per ton of 40 cu. ft. s. d.	s. d.	s. d.	s. d.
Fremantle to Geraldton	1 0 0	1 10 0	0 10 0	0 10 0	1 10 0	1 10 0	4 0	15 0	20 0	20 0	30 0	2 6
" Shark Bay ..	4 10 0	7 10 0	2 10 0	1 10 0	4 0 0	4 0 0	5 0	27 6	35 0	37 6	45 0	3 6
" Carnarvon Roads ..	5 10 0	9 0 0	3 5 0	2 0 0	4 0 0	4 0 0	5 0	32 6	40 0	42 6	50 0	3 6
" Ashburton Roads ..	7 15 0	13 0 0	5 0 0	3 0 0	5 0 0	5 0 0	6 0	35 0	45 0	50 0	60 0	4 6
" Cossack Roads ..	9 5 0	15 0 0	6 5 0	3 15 0	5 0 0	5 0 0	6 0	35 0	45 0	50 0	60 0	5 6
" Port Hedland ..	10 10 0	17 10 0	7 0 0	4 0 0	6 0 0	6 0 0	7 0	45 0	55 0	57 6	70 0	5 6
" Roebuck B (Broome)	11 0 0	18 5 0	7 15 0	4 0 0	6 0 0	6 0 0	8 0	45 0	55 0	57 6	70 0	5 6
" Derby	12 10 0	21 0 0	8 5 0	5 10 0	6 0 0	6 0 0	8 0	47 6	57 6	65 0	75 0	5 6
" Singapore	17 10 0	31 10 0	12 0 0	7 0 0	..	..	..	40 0	..	..	..	..

Freights through to London, from Shark Bay .. .. .. Shell } as arranged.
" { To Trieste } " " }
" { Or Havre } " " }
Freights through London from Pearling Grounds or Cossack .. " }

Wool to London, Sandalwood to Singapore, Sheep to Singapore, as arranged. Beche-de-mer, Cossack to Hong Kong, 60s. per 20cwt.

Freight through from London, Liverpool, Glasgow, and all Continental ports at lowest current rates. Passengers booked through to London, transhipping at Singapore into the P. & O. Company's mail steamers. Fares: Saloon, £68; saloon to Singapore and second cabin thence, £45; circular tickets, available for return to Albany direct, fares; £115 and £68.

* Rates subject to alteration.

Digitized by Google

From Liverpool and Glasgow to Fremantle.

Sailing vessels are despatched at intervals, the London agents being Messrs. Bethell, Gwyn, & Co.; Glasgow agents, Messrs. T. Law & Co.; Liverpool, T. Marwood & Co.; Fremantle, Messrs. Dalgety & Co., Ltd.

THE ADELAIDE STEAMSHIP COMPANY, LIMITED.

Mail contractors for sea-carried mails for the whole of the N.W. mails, and also to the Eastern States.

Albany and Fremantle, to and from Queensland, South Australia, Victoria, and New South Wales. Steamers leave weekly, circumstances permitting.

Regular Royal Mail Steamers run monthly to the Western Australian ports, North of Fremantle (as advertised), specified below.

Frequent service as arranged to and from the Southern ports of the State.

Albany to Esperance Bay and bye ports, Regular Royal Mail steamer (for which the Adelaide S.S. Co., are agents) weekly, extending to Israelite Bay and bye ports fortnightly, and to Eucla quarterly.

Regular and frequent steamers between Geraldton, the Southern Ports, and the Eastern States.

s.s.	"Innamincka"	2,500 tons	s.s.	"Bullarra"	1,725 tons
„	"Wollowra"	2,600 „	„	"Ouraka"	2,637 „
„	"Marloo"	2,600 „	„	"Barrier"	2,036 „
„	"Allinga"	3,000 „	„	"Albany"	878 „
„	"Kadina"	4,000 „	„	"Ferret"	445 „
„	"Willyama"	4,000 „	„	"Karoo"	300 „
„	"Colac"	1,479 „	„	"Moonta"	3,500 „
„	"Investigator"	580 „	„	"Mintaro"	4,500 „
„	"Wakefield"	150 „	„	"Tarcoola"	4,000 „
„	"Kolya"	3,000 „	„	"Dilkera"	4,000 „
„	"Adelaide	1,711 „	„	"Winfield"	5,000 „

Besides a fleet of small steamers, lighters, hulks, etc. A new passenger steamer of 5,000 tons is being built.

Adelaide Steamship Co's. (Limited) Fleet engaged as above.

Agencies.—Adelaide, P. D. Haggart, Secretary; London, G. S. Yuill and Co., Limited, Agents; Melbourne, E. Northcote, General Manager; Sydney, G. S. Yuill and Co., Limited, Agents; Brisbane, E. B. Wareham, Local Manager; Fremantle, W. E. Moxon, Local Manager; Albany, J. H. Downer, Agent; Kalgoorlie, The Adelaide S.S. Co.; Perth, Forrest Emanuel, and Co.; Geraldton, J. C. Butcher,; Bunbury, R. Forrest.

The Adelaide Steamship Company, Limited, supplies the following information useful to passengers by sea to the Eastern States, and to the North-West coast of Western Australia:—

This company run such steamers as the s.s. "Innamincka," 2,500 tons; "Allinga," 3,000 tons; "Adelaide," 2,000 tons;

Digitized by Google

"Wollowra" and "Marloo" (sister ships), 2,600 tons each; "Bullarra," 2,000 tons; and other modern and luxurious vessels are now being built for the trade.

Passengers can travel from Wyndham (North-West), down Western Australian coast to Fremantle, Albany, Esperance Bay, Eucla, and South Australia, Victoria, New South Wales and Queensland (far Northern Coast), a distance of 6,100 miles, or nearly round the continent of Australia.

The Company have offices and agencies at every Australian port, where passengers can obtain all information, shippers' rates, etc.

PRINCIPAL PORTS IN WESTERN AUSTRALIA TOUCHED AT*:—Wyndham (1,950), Derby (1450), Broome (1,250) and Pearling grounds; Port Hedland (1,000) for Condon, Bamboo Creek, Marble Bar, etc.; Cossack (925), Onslow (740), Carnarvon (480), Shark Bay (410), Geraldton (210), Dongara (160), Fremantle, Bunbury (86), Busselton (114), Hamelin (200), Albany (350), Esperance Bay (540).

PORT HEDLAND.—The Government having constructed a substantial jetty at this port, the Adelaide S.S. Co's. mail contract steamer calls each trip N. and S., thus providing facilities for the squatters and miners.

PRINCIPAL PORTS IN SOUTH AUSTRALIA.—Adelaide (1,350M.), Port Pirie, and all Spencer's Gulf Ports. (Weekly from Adelaide.)

VICTORIA.—Melbourne, Geelong, with arrangements for communication with Portarlington, Port Fairy (Belfast), and Warrnambool.

NEW SOUTH WALES.—Sydney, Newcastle, etc.

QUEENSLAND.—Brisbane, Maryborough, Bundaberg, Gladstone, Rockhampton, Mackay (for Broadsound, Habana, and Proserpine River), Bowen, Townsville, Lucinda Pt., Cardwell, Goondi, Geraldton (Johnstone River), Mourilyan Harbour, Cairns (for Daintree and Mossman Rivers), Port Douglas, Cooktown.

DISTANCES TRAVERSED BY ADELAIDE S.S. CO.'S SERVICES.—Wyndham to Fremantle, 1,950 miles, *via* coast; Fremantle to Albany, 350 miles; Fremantle to Adelaide, 1,370 miles; Fremantle to Melbourne, 1,878 miles; Fremantle to Sydney, 2,442 miles; Fremantle to Brisbane, 2,952 miles; Fremantle to Townsville, 3,700 miles; Fremantle to Cairns, 3,860 miles; Fremantle to Cooktown, 3,960 miles; Fremantle to Port Darwin, *via* N.W. Cape, 2,238 miles (steamers at intervals); Fremantle to Derby, 1,450 miles.

* The figures in parentheses denote miles from Fremantle, Western Australia.

Digitized by Google

Adelaide S.S. Co.'s steamers leave approximately—

Eastern ports for Western Australia, about once a week.

Western Australian ports for East, once a week.

New South Wales for Queensland, about twice a week.

Victoria for Queensland, about once weekly.

South Australia for Queensland, about once weekly.

Western Australia (Fremantle) for Northern ports of the State. under contract to Western Australian Government, once a month.

Western Australia (Fremantle) all ports as above, and to Wyndham, once every 56 days.

Western Australia (Fremantle) for Geraldton, Dongara, Bunbury, Busselton (Vasse), and Hamelin Harbour at regular intervals at least twice monthly, each way.

Adelaide to Esperance Bay every week, *via* Albany.

Albany to Esperance, weekly, extending to Israelite Bay fortnightly, and to Eucla quarterly. (Agents for subsidised service.)

Interstate Service—Weekly.

Between Fremantle and Sydney, extending to Queensland ports. calling in either way at the intermediate ports of Bunbury, Vasse. Albany, Adelaide, and Melbourne.

Regular Western Australian and Queensland traders :—

s.s.	"Innamincka"	2,500	tons.
„	"Wollowra"	2,600	„
„	"Adelaide"	2,000	„
„	"Marloo"	2,600	„
„	"Bullarra"	2,000	„
„	"Allinga"	3,000	„
New steamers (2)		5,000	„ (building)

Above are main liners, carrying cargo, and saloon and steerage passengers.

Stock and cargo steamers running to and from Eastern States and North-Western Coast of Western Australia :—

s.s.	"Colac"	2,000	tons.
„	"Moonta"	3,500	„
„	"Kolya"	3,000	„
„	"Dilkera"	4,500	„
„	"Winfield"	5,000	„
„	"Tarcoola"	4,500	„
„	"Nardoo"	5,000	

Fremantle-Derby Service—Monthly.

Calling at Geraldton, Shark Bay, Carnarvon, Ashburton, Cossack, Pearling Grounds, Broome, and Derby.

Digitized by Google

Fremantle-Wyndham Service—Two-Monthly.

Calling at Geraldton, Shark Bay, Carnarvon, Ashburton, Cossack, Port Hedland, and Pearling Grounds, Broome, Derby, and Wyndham.

This service is carried out by the s.s. "Bullarra."

Esperance Bay service, including Royal Mail service to and from Albany :—

s.s. "Dawn" (a) .. .. .. 400 tons.

The Adelaide Steamship Company, Limited, are contractors to Western Australian Government for the carriage of mails as under :—

1. To and from Eastern States as required.
2. To and from the whole of the North-West coast of Western Australia.
3. To Southern coast, Albany to Esperance Bay and Eucla, etc. (Agents for contractors.)

The Adelaide Steamship Company, Limited, have a coal depot and hulks at Fremantle, and also at Albany, and efficient hulks moored in deep water are provided at the principal Australian Ports.

Approximate Passage Rates to Western Australia by the Vessels of the Adelaide Steamship Company.

	Saloon.						Steerage.		
	Single.			Return.			Single.		
	£	s.	d.	£	s.	d.	£	s.	d.
From Sydney—									
Albany	9	0	0	13	10	0	5	0	0
Fremantle	9	0	0	13	10	0	5	0	0
Geraldton	11	0	0	17	0	0	6	0	0
From Melbourne to—									
Albany	7	0	0	10	10	0	4	0	0
Fremantle	7	0	0	10	10	0	4	0	0
Geraldton	9	0	0	14	0	0	5	0	0
From Adelaide to—									
Albany	5	5	0	8	8	0	3	10	0
Fremantle	5	5	0	8	8	0	3	10	0
Geraldton	7	5	0	11	18	0	4	10	0

Freights and Passenger rates vary according to competition.

(a) Belonging to Howard Smith Co., Ltd., the Adelaide S.S. Co., Ltd. being agents.

Digitized by Google

Rates of Passage Money and Freights (approximate.)

Ports.	Passengers.												Cargo.
	1st Class.			Return.			2nd Class.			Natives on Deck.			General.
	£	s.	d.	£	s.	d.	£	s.	d.	£	s	d.	Per ton 40 cubic feet. s. d.
Fremantle to—													
Bunbury	1	1	0	1	11	6	0	15	0		..		12 6
Vasse	1	7	6	2	0	0	0	18	0		..		15 0
Albany	2	0	0	3	0	0	1	0	0		..		12 6
Fremantle to—													
Geraldton	2	0	0	3	10	0	1	0	0	0	15	0	15 0
Shark Bay	4	10	0	7	10	0	2	10	0	1	10	0	27 6
Carnarvon	5	10	0	9	0	0	3	5	0	2	0	0	32 6
Ashburton	7	15	0	13	0	0	5	0	0	3	0	0	35 0
Cossack	9	5	0	15	0	0	6	5	0	3	15	0	35 0
Port Hedland	10	10	0	17	10	0	7	0	0	4	0	0	45 0
Roebuck Bay	11	0	0	18	5	0	7	15	0	4	0	0	45 0
Derby	12	10	0	21	0	0	8	5	0	5	10	0	47 6
Wyndham	16	0	0	26	0	0	10	10	0	7	0	0	57 6

Stock rates by agreement. Sheep from Cossack, Ashburton, and Carnarvon at not more than 4s. per head. Bullocks at £4 per head.

Howard Smith Company, Limited.

The Howard Smith line of steamers maintains a regular and frequent service between Queensland, Sydney, Melbourne, Adelaide, and this State, calling at Albany and Fremantle without transshipment. The steamers occupied in the trade between the Eastern States and Western Australia are—

s.s. "Gabo"	2,060 tons	..	2,000 h.p.
" "Buninyong"	2,070 "	..	2,000 "
" "Time"	3,000 "	..	2,500 "

The passenger vessels are fitted with the electric light, and have good accommodation for both saloon and steerage passengers. The collier "Time" is noted for her stock-carrying capabilities.

The Company is about to introduce new tonnage with up-to-date passenger accommodation to suit all classes.

The small steamer "Dawn," subsidised by the Postal Department to run regularly between Albany, Cape Roche, Bremer Bay, Esperance, and other ports as far as Eucla, until December, 1905, also belongs to this Company.

The rates of passage money and freights are subject to fluctuation, and can be ascertained, on application, at any of the following agencies:—

Howard Smith Company, Limited, Cliff Street, Fremantle; Eben Allen & Co., St. George's Terrace, Perth; Dalgety & Co., Limited, Kalgoorlie; George Wills & Co., Albany; Dalgety & Co., Bunbury; Clutterbuck Bros., Geraldton.

Digitized by Google

The Huddart Parker & Company, Proprietary, Limited.

This Company has a line of steamers running between Melbourne, Fremantle, and Geraldton, and calling *en route* at Adelaide, Albany, Hamelin Harbour, Vasse, and Bunbury. Western Australian Agents—Messrs. Dalgety & Co., Limited, Fremantle, Perth, Albany, Geraldton, and Kalgoorlie.

Direct Sailing Vessel Line—London to Fremantle.

Messrs. Trinder, Anderson, & Co.; Bethell, Gwyn & Co.; and W. Marden (W. A. Shipping Association), Anderson, Anderson, & Co., and Birt, Potter, and Hughes, despatch vessels to Fremantle at intervals of about four weeks. Rate of freight—from 22s. 6d. to 35s. per ton. Average duration of voyage—ninety days. Agents in Western Australia—Messrs. Dalgety & Co., Limited; Sir George Shenton, and the W. A. Shipping Association, Fremantle.

Rates of Freight.

Weight	22s. 6d. to 27s. 6d. per ton of 20cwt.
Salt	22s. 6d. do. do.
Measurement	32s. 6d. to 35s. per ton of 40 cubic feet.
Cement	3s. 6d. per barrel.
Bulk Beer	55s. per ton of 4 hogsheads.
Bulk Wines and Spirits	65s. do. do.

McIlwraith, McEacharn & Co. Proprietary, Limited.

The Company has a fleet of eight steamers, trading between all ports of the Eastern States of Australia and Western Australian ports.

Branch Offices in Western Australia.—Messrs. McIlwraith. McEacharn, & Co. Proprietary, Limited, Fremantle and Albany.

Sub-Agencies.—Perth, Jas. McBean, Esq.; Coolgardie, F. A. Davis, Esq.; Kalgoorlie, Hocking & Co., Limited.

The names of the steamers at present engaged in the service are:—

s.s.	"Cooeyanna"	5,500 tons.
„	"Kooringa"	5,000 „
„	"Kalgoorlie"	4,500 „
„	"Coolgardie"	3,500 „
„	"New Guinea"	3,500 „
„	"Cloncurry"	3,500 „
„	"Tagliaferro"	2,000 „
„	"Norkoowa"	2,000 „

Digitized by Google

The rates for passengers and freights vary according to the circumstances at the time, but may be gauged on the basis of those charged by the other interstate companies.

McIlwraith, McEacharn, & Co. Proprietary, Limited, maintain a regular cargo and passenger service from Newcastle, Sydney, Melbourne, and Adelaide to Albany, Fremantle, and Geraldton, connecting with train service at Albany and Geraldton ; also a through service for North-West ports of Western Australia when inducement offers. In this latter direction a special service is established from the Eastern States to Calcutta, calling at all North-West and Java ports *en route.*

This Company also import coal, being contractors for the supply of coal to the West Australian Government railways, the Midland railways, and the Perth and Fremantle Gas Companies. They also supply coal and coke to the mining companies and other private consumers. Bunker coal is supplied to the mail and other steamship services from a fleet of hulks at Fremantle and at Albany.

Messrs. McIlwraith, McEacharn, & Co. Proprietary, Limited, conduct a river service between Fremantle and Perth, delivering cargo at the Melville Park wharf, at Perth, and receiving cargo at the same wharf for shipment to the Eastern States.

Fresh water from Perth or Fremantle is also supplied to steamers alongside wharves or at anchorages. River steamers are available for excursion trips.

Australasian United Steam Navigation Co., Ltd.

The Australasian United Steam Navigation Company, Limited, (P. Ridley, Manager for Western Australia), Head Office, Brisbane, Queensland, runs a fortnightly service with the "Kanowna" and "Kyarra" between Sydney and Fremantle, calling at Melbourne and Adelaide *en route.* The Company's saloon passage tickets are at present interchangeable after first port of call with those of the Adelaide Steamship Company, Ltd., McIlwraith, McEacharn, & Co. Proprietary, Ltd., Howard Smith & Co., Ltd., and Huddart Parker and Co. Proprietary, Ltd. (Conditions on application.) As these Companies despatch steamers at regular intervals of three or four days, this arrangement enables passengers to break their journey at any of the intermediate ports, and to continue same by any subsequent steamer belonging to the five lines referred to during the currency of the ticket (6 months), thus giving travellers privileges unequalled in any part of the world.

Digitized by Google

Australasian United Steam Navigation Company, Limited, Fleet.

Passenger Steamers.		*Cargo Steamers.*	
"Kanowna"	6,932 tons	"Moira"	2,184 tons
"Kyarra"	6,953 "	"Mildura"	2,217 "
"Pilbarra"	2,665 "	"Marceba"	1,747 "
"Wyandra"	4,058 "	"Elamang"	946 "
"Wodonga"	2,341 "	"Tinana"	791 "
"Aramac"	2,114 "	*Tenders.*	
"Arawatta"	2,114 "	"Tay"	360 "
"Cintra"	1,979 "	"Taldora"	232 "
"Rockton"	1,971 "	"Dolphin"	131 "
"Warrego"	1,552 "	"Hornet"	55 "
"Maranoa"	1,505 "	"Wasp"	20 "
"Birksgate"	1,458 "	*Hulks.*	
"Eurimbla"	1,055 "	"Gunga"	1,257 "
"Kuranda"	928 "	"Manly"	100 "
"Yaralla"	482 "		
"Palmer"	267 "		

The Australasian United Steam Navigation Company conducts the following mail and passenger lines, which connect with the West Australian Service.

Melbourne to Cooktown (Queensland) Weekly Mail Service.—Steamers leave Melbourne for Cooktown every Saturday, *via* Sydney, Brisbane, Rockhampton, Mackay, Bowen, Townsville, Cairns, and Port Douglas.

Brisbane-Townsville Line—Weekly Service.—The s.s. "Barcoo" runs a fast mail service between Brisbane and Townsville every Friday, at 9 a.m., calling *en route* at Gladstone, Mackay, and Bowen. This service is conducted in conjunction with the Queensland Railway Department, and steamer and rail tickets are now interchangeable.

Townsville-Cairns Line—Weekly Mail Service.—Steamers leave Townsville every Monday, calling *en route* at Lucinda, Port Cardwell, Mourilyan Harbour, and Geraldton (Q.)

Brisbane to Thursday Island, Normanton, Burketown, via Townsville and Cooktown—Tri-weekly Mail Service.—The s.s. "Maranoa" leaves Brisbane every third Tuesday, at 5 p.m.

Sydney-Fiji and New Caledonia—Monthly Service.—The s.s. "Birksgate" leaves Sydney every four weeks.

The Australasian United Steam Navigation Company have the credit and honour of being the first interstate Company (and so far the only one) to place large passenger steamers of from 4,000 to close upon 7,000 tons *gross* register on the coast of Western Australia.

The Company has its own offices at Perth (Town Hall Buildings, Barrack Street), and at Fremantle (Bank of New South Wales Buildings, Cliff Street), and is represented at Kalgoorlie and Coolgardie by T. Stodart and Co.; Geraldton, by Burns, Philp, & Co., Ltd.; Albany, by Geo. Wills & Co., Ltd., and at Bunbury by T. Hayward and Son.

Rates of passage money and freight may be obtained from the above-mentioned.

Digitized by Google

The Australasian United Steam Navigation Company are agents for the following lines of steamers :—(1.) Canadian-Australian Royal Mail Line of steamers, which ply between Sydney and Vancouver, calling *en route* at Brisbane, Fiji, and Honolulu (Sandwich Islands), and connect with the Canadian Pacific Railway.

(2). The New Zealand Shipping Company, Ltd., Royal Mail Line of steamers, New Zealand to London. *via* Monte Video, Teneriffe, and Plymouth.

(3.) The British India Steam Navigation Company, Limited—Calcutta to Australia, *via* Singapore.

Direct Line of Sailing Vessels from the Continent to Fremantle.

The above line started six years ago, sending only one vessel the first year. The application for space has increased to such an extent that now a vessel is despatched every six or eight weeks from Hamburg.

The ships are despatched from Hamburg, but goods are booked at through rate from all parts of the Continent to all parts of this State. Average duration of voyage, 90 days.

The freights vary according to the freight market, but are usually 2s. 6d. per ton below the London rate.

Provision is made on all sailers of this line to carry explosives.

The vessels are consigned to Messrs. Strelitz Bros., Fremantle, who are the West Australian agents and Correspondents.

Hamburg Agent, Paul Adler.

German-Australian Steamship Company, Limited.

The steamers of the above Company call at Fremantle every four weeks. After leaving Hamburg they call at Antwerp and Port Elizabeth, and then proceed direct to Fremantle.

Owing to this Company having large contracts for carrying explosives they do not cater for the passenger traffic.

Cargo is booked from Hamburg and all other Continental ports to Fremantle, Perth, Bunbury, Albany, on through bills of lading.

The homeward journey from Fremantle is made *via* Singapore, Colombo, and Suez Canal. Goods are booked to above places and all European ports.

Digitized by Google

The following is the list of steamers owned by the above Company :—

	tons		tons
"Altona" (building) ..	abt 4,500	"Kiel"	abt. 5,143
"Apolda"	4,950	"Laeisz"	5,157
"Augsburg"	4,907	"Madgeburg"	5,154
"Bergedorf	5,108	"Meissen"	5,209
"Bielfeld"	5,186	"Offenbach"	5,442
"Chemnitz"	2,758	"Rostock"	4,972
"Duisburg"	5,155	"Solingen"	2,844
"Elbing"	5,677	"Sommerfeld"	2,606
"Essen"	2,939	"Sonneberg"	4,499
"Flensburg	4,435	"Stassfurt"	3,231
"Harburg"	5,217	"Varzin"	5,192
"Itzehoe"	5,217		

The sole agents in Western Australia are Messrs. Strelitz Bros., Mouatt Street, Fremantle, from whom full information about rates of freight can be obtained.

Melbourne Steamship Company, Limited.

This Company has established a fortnightly steam service between Newcastle, Sydney, Melbourne, Adelaide, Bunbury, Fremantle, and Geraldton, without transshipment. Of its fleet of steamers, the powerful s.s. "Perth" (2,500 tons) and the new fast s.s. "Sydney" (3,000 tons) were specially built in England and Scotland, respectively, for the West Australian trade, the latter vessel having only just recently been launched.

Both vessels are classed 100 A1 at Lloyd's, have first-class passenger accommodation, and are fitted with electric light throughout.

As both vessels of this line run through from Newcastle to Geraldton *via* ports, passengers are not put to the inconvenience of transshipping.

The Company's Office is in Cliff Street, Fremantle, where all particulars regarding steamers' movements, rates of freight, and passage-money can be obtained.

The Company is represented at Albany by Dalgety & Co., Ltd.; at Bunbury, by Robert Forrest; at Geraldton, by Burns, Philp, & Co., Ltd.; and in Perth by H. G. Barker & Co., St. George's Terrace.

Head Office for Western Australia :—Cliff Street, Fremantle.

Lund's Blue Anchor Line.

Lund's steamers call at Albany, on the homeward voyage, every four weeks; and proceed to London *via* Port Natal and Capetown.

Fares, Albany to London, from £16 to £52; Albany to Natal and Capetown, from £13 13s. to £31 10s.

Digitized by Google

Cargo is carried to London and Cape ports at rates current in Eastern States.

Vessels engaged in the trade are:—

"Commonwealth"	6,000 tons	"Warrigal"	4,387 tons
"Narrung"	5,078 „	"Yarrawonga"	4,011 „
"Wakool"	5,013 „	"Bungaree"	2,893 „
"Wilcannia"	5,000 „		

The Line is represented in Western Australia by George Wills & Co., Albany and Fremantle.

British India Steam Navigation Company, Limited.

The British India Steam Navigation Company, Limited (P. Ridley, Fremantle, Agent), is the largest steamship Company flying the British flag. Steamers of over 5,000 tons trade regularly between Calcutta and other Indian ports, *via* Singapore to Australia and New Zealand, making Fremantle the first port of call in Australia.

The following is the fleet of steamers visiting Australia:—

"Islanda"	5,237 tons	"Surada"*	5,238 tons
"Ismalia"	5,265 „	"Ujina"	5,310 „
"Itinda"*	5,203 „	"Uganda"*	5,366 „
"Muttra"*	4,644 „	"Ula"*	5,310 „
"Onda"	5,247 „	"Umballa	5,310 „
"Orissa"	5,436 „	"Umta"	5,366 „
"Sangola"*	5,149 „	"Upada"	5,257 „
"Satara"	5,150 „	"Vadala	3,334 „
"Sealda"*	5,030 „	"Virawa"	3,334 „
"Sofala"*	5,030 „		

* Have visited Fremantle.

For information as to rates of passage-money and freight, application may be made to P. Ridley, Australasian United Steam Navigation Company, Limited, Fremantle.

The New Zealand and South African Steamship Company.

This Company trades between New Zealand, Sydney, Fremantle, Durban, and Cape Town.

The vessels generally employed are:—"Surrey," "Sussex," "Dorset," "Suffolk," "Cornwall," "Devon," and "Somerset." These steamers are of 6,000 tons gross tonnage.

Freights to South Africa are:—General cargo, 40s.; to Durban, 35s.

Passage Money.—Saloon, £25 to Durban; £27 10s. to Cape Town. Steerage, £13 13s. to Durban; £15 15s. to Cape Town.

Digitized by Google

The London agents are Messrs. Birt, Potter, & Hughes; Sydney agents, Birt & Co., Macquarie Place.; Wellington agents, Kinsey, Barnes, & Co.; Fremantle and Perth agents, William Sandover & Co.

James Bell and Company.

James Bell & Co., Cliff-street, Fremantle (branches Adelaide, Sydney, Dunedin, Newcastle, and Durban).

Bi-weekly service to Geraldton per s.s. "Julia Percy," 580 tons. Fares:—Saloon, single, £1 10s.; return, £2 10s. Steerage, single, £1; return, £1 10s. Rate of freight, 10s. per ton.

S.S. "A. J. Hocken," Fremantle to Wyndham, about every three weeks. Cargo only. Rate, 40s. per ton.

2.—EMIGRATION TO WESTERN AUSTRALIA.

Assisted Passages, as at present granted by the Government of Western Australia, are subject to the following conditions and regulations:—

The classes eligible are: Married and single farm labourers under 40 years of age, also single women or widows (without children), such as cooks, housemaids, nurses, general servants, dairymaids, etc., not over 40 years of age, who are nominated by their friends in Western Australia, provided such nominations have been approved by the Government in the State. In all cases they must be sober, industrious, of good moral character, of sound mind, free from bodily defect or deformity, in good health, able to perform the duties of their special occupation, and must be going to the State to reside and settle there, and to work in their respective occupations. All emigrants receiving assisted passages must either have been vaccinated or have had the smallpox. For each emigrant over 12 years of age the Government contributes £7 10s. towards the passage money, the emigrant or his nominator paying the difference, which latter sum varies from £7 10s. to £13 10s., according to the accommodation required; children from three to twelve being charged half-fare.

Persons who have resided in Western Australia are not in any case eligible for assisted passages, nor persons in the habitual receipt of parish relief, children under twelve years of age without their parents, husbands without their wives, or wives without their husbands (unless in the last three instances the parents, wife or husband, be in Western Australia), nor single women who have illegitimate children

No person is granted an assisted passage unless his application has been first approved by the Agent General. No single or married men above the age of 40 years are allowed any assistance, except under very exceptional circumstances.

During the past few years there has been a fair demand for men in the building trades, and farm labourers.

Remunerative labour exists for market gardeners, poultry farmers, and fruit-growers; the soil and climate being especially suitable for fruit-growing. Farm labourers are, as a rule, boarded and lodged; single men being preferred to married men with families. Men mostly find employment who are ready to turn their hands to all kinds of farm and station work, to cut down timber or use a pick and shovel, and do not object to "roughing it" in the bush. Navvies, carpenters, joiners, bricklayers and masons, sawyers, smiths, wheelwrights, tanners, gardeners, and others are at times in demand.

There is, on the whole, a fair demand for mechanics, but none for miners, and but little for general labourers; agricultural labourers and female domestic servants have, however, no difficulty in finding employment.

It should be remembered that the population of the State, though it has rapidly increased, is still small, and that, therefore, the demand for all kinds of labour is necessarily limited. It is very difficult for clerks, accountants, bookkeepers, and others whose work is of a clerical nature, to find employment anywhere. On the other hand, there is a good demand for cooks, general female servants, and laundresses, and to a slight extent for dressmakers. There is also a good opening for market gardeners, fruitgrowers, and farmers, who have some little capital, say about £150, as fruits and vegetables sell at high prices.

The cost of living is high in certain respects, but house rent, at any rate is, naturally, now more reasonable than it was at the time of the opening up of the Eastern goldfields. Board and lodging for single persons cost from fifteen shillings to twenty-five shillings a week in the South, and more in the Northern towns.

The eight hours' working day is recognised in the majority of the trades.

Intending immigrants can obtain the latest and fullest particulars as to employment, wages, cost of living, etc., either by personal or written application at or to the office of the Agent-General for Western Australia, which is situated at 15 Victoria Street, London, S.W.

Digitized by Google

Number of Free and Nominated Immigrants introduced into Western Australia during the Year 1903.

Month	Vessel.	Adults.			Children under 12.			Grand Total.		
		M.	F.	Total.	M.	F.	Total.	M.	F.	Total.
Jan.	Freidrich der Grosse ..	..	1	1	..	..	..	..	1	1
Feb.	Persic	1	..	1	..	..	..	1	..	1
Mar.	Rhein	1	3	4	..	..	..	1	3	4
Mar.	Orontes	..	5	5	2	1	3	2	6	8
April	Oldenburg	2	3	5	1	1	2	3	4	7
April	Ophir	3	1	4	..	1	1	3	2	5
April	Karlsruhe	1	..	1	..	..	..	1	..	1
May	Omrah	2	2	4	1	2	3	3	4	7
May	Ormuz	3	3	6	4	1	5	7	4	11
June	Darmstadt	..	2	2	..	1	1	..	3	3
June	Prinz Regent Luitpold	..	2	2	1	1	2	1	3	4
July	Oruba	4	4	8	2	..	2	6	4	10
July	Gera	..	3	3	1	1	2	1	4	5
July	Orontes	1	1	2	..	1	1	1	2	3
Aug.	Omrah	2	..	2	..	..	..	2	..	2
Aug.	Oldenburg	1	2	3	1	1	2	2	3	5
Aug.	Persic	..	3	3	..	2	2	..	5	5
Aug.	Orient	1	3	4	..	1	1	1	4	5
Sept.	Oratava	..	1	1	..	..	..	..	1	1
Sept.	Karlsruhe	..	2	2	..	..	..	..	2	2
Sept.	Ormuz	1	..	1	..	..	..	1	..	1
Oct.	Afric	1	1	2	3	..	3	4	1	5
Oct.	Orontes	6	3	9	2	..	2	8	3	11
Oct.	Gneisenau	4	4	8	..	..	..	4	4	8
Oct.	Oroya	2	3	5	4	6	10	6	9	15
Oct.	Konigin Luise ..	5	3	8	1	1	2	6	4	10
Nov.	Ortona	1	11	12	..	4	4	1	15	16
Nov.	Bremen	3	3	6	3	..	3	6	3	9
Nov.	Orizaba	1	..	1	..	..	..	1	..	1
Dec.	Barbarossa	3	1	4	1	2	3	4	3	7
Dec.	Ophir	4	5	9	4	2	6	8	7	15
Dec.	Omrah	3	1	4	1	..	1	4	1	5
Dec.	Persic	..	3	3	..	..	..	..	3	3
	Totals	56	79	135	32	29	61	88	108	196

Number of Free and Nominated Immigrants introduced into Western Australia during each of the Ten Years, 1894 *to* 1903.

Year.	Adults. (12 years and upwards.)			Children under 12 years of Age.			Grand Total.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
1894 ..	11	169	180	6	13	19	17	182	199
1895 ..	23	110	133	5	6	11	28	116	144
1896 ..	9	117	126	3	7	10	12	124	136
1897 ..	25	129	154	15	11	26	40	140	180
1898 ..	29	63	92	..	5	5	29	68	97
1899 ..	17	24	41	4	4	8	21	28	49
1900 ..	25	70	95	12	17	29	37	87	124
1901 ..	26	41	67	30	28	58	56	69	125
1902 ..	47	65	112	28	20	48	75	85	160
1903 ..	56	79	135	32	29	61	88	108	196

Digitized by Google

3.—LIST OF CONSULS OF FOREIGN COUNTRIES RESIDING IN WESTERN AUSTRALIA.

Country represented.	Name of Consul, Vice Consul, or Consular Agent.	Office at—
Belgium	Shenton, E. C., Consul	Perth
Denmark	Strelitz, Richard, Do.	Fremantle
Do.	Strelitz, Paul, Acting Consul ..	Do.
France	Wittenoom, Sir E. H., Consular Agent	Perth and Fremantle
Germany	Ratazzi, L., Consul	Fremantle
Greece	Downing, H. P., Vice Consul ..	Perth
Italy	Zunini, Leopoldo, Vice Consul ..	Do.
Do.	Ratazzi, L., Consular Agent ..	Fremantle
Netherlands, The ..	Demel, L., Consul	Do.
Paraguay	Pearson, John Swift, Consul ..	Perth
Sweden and Norway	Strelitz, Richard, Consul	Perth and Fremantle
Do.	Strelitz, Paul, Acting Consul ..	Do. do.
Do.	Haynes, S. J., Vice Consul ..	Albany
U.S. of America ..	Allan, A. D., Consular Agent ..	Fremantle
Do.	Dymes, F. R., Do. ..	Albany.

Digitized by Google

APPENDICES.

A.—STATISTICS OF WESTERN AUSTRALIA.

NOTE.—In the population figures contained herein, allowance for unrecorded departures from 1st April, 1901, has been made in accordance with the resolutions of the 1903 Conference of Statisticians.

Digitized by Google

I.—POPULATION AND VITAL STATISTICS.

No. 1.—*Population of Western Australia (exclusive of full-blooded Aboriginals) since 1894.*

Period.	Estimated Population on the last day of period referred to.			Increase during period by excess of arrivals over departures and excess of births over deaths.		Number of Females to 100 Males.	Mean Population.
	Males.	Females.	Total.	Numerical.	Rate per cent. per annum.		
Year 1894	53,121	28,893	82,014	16,977	26·10	54·39	75,055
Do. 1895	66,579	34,564	101,143	19,129	23·32	51·91	90,148
Do. 1896	91,586	46,210	137,796	36,653	36·24	50·46	122,696
Do. 1897	103,880	57,814	161,694	23,898	17·34	55·65	155,563
Do. 1898	105,440	62,370	167,810	6,116	3·78	59·15	168,999
Do. 1899	105,708	64,943	170,651	2,841	1·69	61·44	168,528
Do. 1900	109,923	69,785	179,708	9,057	5·31	63·49	176,905
Do. 1901	118,241	75,868	194,109	14,401	8·01	64·16	188,313
Do. 1902	129,386	83,941	213,327	19,218	9·90	64·88	205,755
Do. 1903	135,961	90,993	226,954	13,627	6·39	66·93	221,278
Month of January, 1904 * ...	**136,589**	**91,205**	**227,794**	**840**	**4·45**	**66·77**	**227,374**
Do. February, 1904 * ...	**137,747**	**91,815**	**229,562**	**1,768**	**9·31**	**66·66**	**228,678**
Do. March, 1904 * ...	**139,039**	**92,773**	**231,812**	**2,250**	**11·76**	**66·73**	**230,687**
Do. April, 1904 * ...	**140,014**	**93,631**	**233,645**	**1,833**	**9·49**	**66·87**	**232,729**
Do. May, 1904 * ...	**141,326**	**94,683**	**236,009**	**2,364**	**12·14**	**67·00**	**234,827**
Five months ended 31st May, 1904 *	**141,326**	**94,683**	**236,009**	**9,055**	**9·58**	**67·00**	**230,859**

* All figures in black type are preliminary figures, liable to revision.

Digitized by Google

No. 2.—*Immigration into and Emigration from Western Australia since 1894.*

Period.	Immigration.			† Emigration.			Excess of Immigration over Emigration.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
Year 1894	20,892	4,966	25,858	8,307	1,616	9,923	12,585	3,350	15,935
Do. 1895	22,245	7,278	29,523	8,778	2,385	11,163	13,467	4,893	18,360
Do. 1896	40,274	14,941	55,215	15,252	4,072	19,324	25,022	10,869	35,891
Do. 1897	32,375	17,012	49,387	20,292	6,575	26,867	12,083	10,437	22,520
Do. 1898	20,874	11,835	32,709	20,095	8,750	28,845	779	3,085	3,864
Do. 1899	12,094	8,184	20,278	12,949	7,338	20,287	‡855	846	‡9
Do. 1900	14,600	10,321	24,921	11,687	7,391	19,078	2,913	2,930	5,843
Do. 1901	21,249	11,513	32,762	14,224	7,336	21,560	7,025	4,177	11,202
Do. 1902	24,896	12,964	37,860	15,160	6,891	22,051	9,736	6,073	15,809
Do. 1903	19,294	11,649	30,943	14,323	6,904	21,227	4,971	4,745	9,716
Month of January, 1904	1,777	845	2,622	1,282	806	2,088	495	39	534
Do. February, 1904	2,113	1,096	3,209	1,069	678	1,747	1,044	418	1,462
Do. March, 1904 ...	2,362	1,475	3,837	1,210	723	1,933	1,152	752	1,904
Quarter ended 31st March, 1904	6,252	3,416	9,668	3,561	2,207	5,768	2,691	1,209	3,900
Month of April, 1904 ...	1,973	1,273	3,246	1,115	610	1,725	858	663	1,521
Do. May, 1904 * ...	**1,987**	**1,316**	**3,303**	**838**	**437**	**1,275**	**1,149**	**879**	**2,028**
Five months ended 31st May, 1904 *	**10,212**	**6,005**	**16,217**	**5,514**	**3,254**	**8,768**	**4,698**	**2,751**	**7,449**

* All figures in black type are preliminary figures, liable to revision. † Including allowance for unrecorded departures.
‡ Excess of Emigration over Immigration.

Digitized by Google

No. 3.—Nationalities of Immigrants to and Emigrants from Western Australia during the twelve months ended 31st December, 1903, and the three months ended 31st March, 1904.

Nationality.	Arrivals.						Departures.						Excess of Arrivals over Departures.					
	Twelve months ended 31st December, 1903.			Three months ended 31st March, 1904.			Twelve Months ended 31st December, 1903.			Three months ended 31st March, 1904.			Twelve months ended 31st December, 1903.			Three months ended 31st March, 1904.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
European.																		
British	17,153	11,451	28,604	5,528	3,361	8,889	12,258	6,441	18,699	2,996	2,068	5,064	4,895	5,010	9,905	2,532	1,293	3,825
Italian	417	26	443	214	3	217	559	21	580	146	3	149	*142	5	*137	68	..	68
German	197	79	276	70	29	99	172	51	223	57	18	75	25	28	53	13	11	24
French	26	19	45	8	7	15	48	23	71	10	6	16	*22	*4	*26	*2	1	*1
Russian	20	15	35	9	..	9	5	..	5	1	1	2	15	15	30	8	*1	7
Greek	52	6	58	7	..	7	28	2	30	3	..	3	24	4	28	4	..	4
Austrian	90	2	92	11	3	14	21	2	23	9	..	9	69	..	69	2	3	5
Spanish	16	1	17	2	..	2	..	..	..	2	..	2	16	1	17	..	..	..
Swedish	22	4	26	2	2	4	9	2	11	6	2	8	13	2	15	*4	..	*4
Norwegian	4	2	6	..	..	..	4	2	6	3	..	3	..	..	..	*3	..	*3
Hungarian	1	4	5	2	..	2	1	..	1	..	..	..	..	4	4	2	..	2
Turkish	..	..	..	..	..	..	5	..	5	..	..	..	*5	..	*5	..	..	..
Danish	4	1	5	2	2	4	1	..	1	2	..	2	3	1	4	..	2	2
Swiss	5	9	14	2	..	2	4	..	4	2	..	2	1	9	10	..	..	..
Belgian	1	..	1	..	1	1	..	..	..	..	..	..	1	..	1	..	1	1
Dutch	1	1	2	..	..	..	..	..	..	1	..	1	1	1	2	*1	..	*1
Bohemian	1	1	2	1	..	1	..	..	..	..	..	..	1	1	2	1	..	1
Portuguese ..	..	..	..	..	..	..	1	..	1	..	..	..	*1	..	*1	..	..	..
Asiatic.																		
Malay	475	..	475	121	..	121	159	..	159	69	..	69	316	..	316	52	..	52
Chinese	258	..	258	49	..	49	164	2	166	30	..	30	94	*2	92	19	..	19
Manillamen ..	33	..	33	15	..	15	42	..	42	8	..	8	*9	..	*9	7	..	7
Japanese	464	20	484	109	4	113	86	24	110	30	4	34	378	*4	374	79	..	79
Afghan	7	..	7	1	..	1	37	..	37	13	..	13	*30	..	*30	*12	..	*12
Indian	17	2	19	7	..	7	17	2	19	..	..	..	..	..	..	7	..	7

Javanese .. .	5	..	5	25	..	25	4	..	4	1	..	1	1	..	1	24	..	24
Arab	1	2	3	1	..	1	..	..	..	..	..	..	1	2	3	1	..	1
Siamese .. .	1	..	1	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..
Cingalese	2	..	2	..	..	..	1	..	1	..	..	..	1	..	1	..	..	..
Persian	1	..	1	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..
Timorese	..	..	..	60	..	60	..	..	..	..	..	..	..	..	..	60	..	60
Undefined . ..	1	..	1	..	..	..	1	..	1	1	..	1	..	..	..	*1	..	*1
AMERICAN.																		
U.S.A.	1	..	1	..	1	1	1	..	1	..	..	..	..	..	..	..	1	1
Brazilian	..	..	..	..	..	..	1	..	1	..	..	..	*1	..	*1	..	..	..
Mexican .. .	..	..	..	..	..	..	1	..	1	..	..	..	*1	..	*1	..	..	..
Undefined . .	11	4	15	3	1	4	7	2	9	1	..	1	4	2	6	2	1	3
POLYNESIAN																		
Maori .. .	..	..	..	2	..	2	..	..	..	..	..	..	..	..	..	2	..	2
Undefined . .	7		7	..		.	..	..	..	..	..	..	7	..	7	..	..	..
INDEFINITE.																		
Jewish .. .	..	..	..	1	2	3	3	1	4	..	..	..	*3	*1	*4	1	2	3
Total ..	10,294	11,649	30,943	6,252	3,416	9,668	13,641	6,575	20,216	3,391	2,102	5,493	5,653	5,074	10,727	2,861	1,314	4,175

* Excess of Departures over Arrivals.

Digitized by Google

4.—*Immigrants to and Emigrants from Western Australia during the twelve months ended 31st December, 1903, and the three months ended 31st March, 1904, classified according to Countries from which arrived or to which bound.*

Countries from which arrived or to which bound.	Arrivals.						Departures.						Excess of Arrivals over Departures.					
	Twelve months ended 31st December, 1903.			Three months ended 31st March, 1904.			Twelve Months ended 31st December, 1903.			Three months ended 31st March, 1903.			Twelve months ended 31st December, 1903.			Three months ended 31st March, 1904.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
Australasia.																		
Victoria	8,163	5,918	14,081	2,429	1,670	4,099	4,767	2,866	7,633	1,133	937	2,070	3,396	3,052	6,448	1,296	733	2,029
South Australia ..	5,991	3,471	9,462	2,254	1,116	3,370	4,514	2,022	6,536	1,181	670	1,851	1,477	1,449	2,926	1,073	446	1,519
New South Wales ..	2,105	1,386	3,491	665	394	1,059	1,503	826	2,329	492	280	772	602	560	1,162	173	114	287
New Zealand ..	7	1	8	..	..	..	3	..	3	..	..	..	4	1	5	..	..	..
Queensland	42	..	42	..	..	..	..	..	..	..	..	..	42	..	42	..	..	..
Tasmania	..	..	..	3	1	4	..	..	..	..	..	..	..	..	..	3	1	4
Europe.																		
Great Britain ..	679	495	1,174	147	132	279	848	452	1,300	181	133	314	*169	43	*126	*34	*1	*35
Italy	503	59	562	213	5	218	496	42	538	140	25	165	7	17	24	73	*20	53
Belgium	177	114	291	25	22	47	4	..	4	..	..	..	173	114	287	25	22	47
France	117	44	161	24	13	37	52	19	71	6	5	11	65	25	90	18	8	26
Germany	57	29	86	9	..	9	48	14	62	16	7	23	9	15	24	*7	*7	*14
Asia.																		
Straits Settlements..	1,182	46	1,228	297	10	307	522	70	592	169	7	176	660	*24	636	128	3	131
Ceylon	75	26	101	35	10	45	85	18	103	20	10	30	*10	8	*2	15	..	15
India	7	1	8	..	..	..	..	..	..	1	..	1	7	1	8	*1	..	*1
Aden	7	1	8	..	..	..	6	..	6	..	..	..	1	1	2	..	..	..
Timor	11	..	11	60	..	60	41	..	41	1	..	1	*30	..	*30	59	..	59
Java	4	..	4	1	..	1	..	..	..	..	..	..	4	..	4	1	..	1
Africa.																		
Egypt	44	25	69	4	..	4	24	3	27	17	1	18	20	22	42	*13	*1	*14
South Africa ..	122	32	154	86	43	129	726	242	968	34	27	61	*604	*210	*814	52	16	68
Mauritius	..	1	1	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..
Pacific Islands.																		
New Caledonia ..	1	..	1	..	..	..	2	1	3	..	..	..	*1	*1	*2	..	..	..
Total ..	19,294	11,649	30,943	6,252	3,416	9,668	13,641	6,575	20,216	3,391	2,102	5,493	5,653	5,074	10,727	2,861	1,314	4,175

*Excess of Departures over Arrivals.

No. 5.—*Number of Marriages, Births, and Deaths registered in Western Australia since 1894.*

Period.	Number of Marriages registered during the period.	Number of Births registered during the Period.			Number of Deaths registered during the Period.			Excess of Births over Deaths.	Annual Birth, Death, and Marriage Rate per 1,000 of the mean Population, represented by the number of registrations.		
		Males.	Females.	Total.	Males.	Females.	Total.		Birth Rate.	Death Rate.	Marriage Rate.
Year 1894	482	1,109	1,014	2,123	755	826	1,081	1,042	28·29	14·40	6·42
Do. 1895	633	1,192	1,181	2,373	1,201	403	1,604	769	26·32	17·79	7·02
Do. 1896	1,077	1,435	1,347	2,782	1,450	570	2,020	762	22·67	16·46	8·78
Do. 1897	1,659	2,036	1,985	4,021	1,825	818	2,643	1,378	25·85	16·99	10·66
Do. 1898	1,674	2,574	2,394	4,968	1,793	923	2,716	2,252	29·40	16·07	9·91
Do. 1899	1,671	2,636	2,538	5,174	1,513	811	2,324	2,850	30·70	13·79	9·92
Do. 1900	1,781	2,789	2,665	5,454	1,487	753	2,240	3,214	30·83	12·66	10·07
Do. 1901	1,821	2,946	2,772	5,718	1,653	866	2,519	3,199	30·36	13·38	9·67
Do. 1902	2,024	3,241	2,991	6,232	1,832	991	2,823	3,409	30·29	13·72	9·84
Do. 1903	2,064	3,433	3,266	6,699	1,829	959	2,788	3,911	30·27	12·60	9·33
Month of January, 1904 * ...	**171**	**301**	**278**	**579**	**168**	**105**	**273**	**306**	**30·56**	**14·41**	**9·02**
Do. February, 1904 * ...	**148**	**281**	**262**	**543**	**167**	**70**	**237**	**306**	**28·49**	**12·44**	**7·77**
Do. March, 1904 * ...	**176**	**297**	**283**	**580**	**157**	**77**	**234**	**346**	**30·17**	**12·17**	**9·15**
Quarter ended 31st March 1904 *	**495**	**879**	**823**	**1,702**	**492**	**252**	**744**	**958**	**29·68**	**12·97**	**8·63**
Month of April, 1904 * ...	**203**	**280**	**301**	**581**	**163**	**106**	**269**	**312**	**29·96**	**13·87**	**10·46**
Do. May, 1904 * ...	**185**	**319**	**284**	**603**	**156**	**111**	**267**	**336**	**30·81**	**13·64**	**9·45**
Five months ended 31st May, 1904 *	**883**	**1,478**	**1.408**	**2,886**	**811**	**469**	**1,280**	**1,606**	**30·00**	**13·31**	**9·18**

* All figures in black type are preliminary figures, liable to revision.

Digitized by Google

II.—FINANCE.

(Tables Nos. 6 to 13, inclusive, compiled from Returns supplied by L. S. Eliot, Under Treasurer.)

No. 6.—*Details of State Revenue of Western Australia.*

Period.	Collected by the State.								Surplus Commonwealth Revenue returned to the State.	Total State Revenue.	Total State Revenue per head of mean population.		
	Taxation.	Land.	Mining.	Railways and Tramways.	Water Supply.	Harbour.	Other Sources.	Total.					
	£	£	£	£	£	£	£	£	£	£	£	s.	d.
Year ended 30th June, 1902 ...	173,582	145,738	113,644	1,488,574	15,034	23,776	168,699	2,129,047	1,225,076	3,354,123	17	1	7
Do. do. 1903 ...	221,247	156,659	116,590	1,598,023	30,048	42,159	209,781	2,374,507	1,255,731	3,630,238	16	18	9
Month of July, 1903	14,645	5,636	5,361	88,183	489	4,297	5,328	123,939	109,436	233,375	1	1	0
Do. August, 1903 ...	10,338	6,643	7,730	126,690	952	4,154	9,526	166,033	110,772	276,805	1	4	9
Do. September, 1903 ...	21,746	43,365	7,586	144,514	987	6,209	17,073	241,480	87,669	329,149	1	9	3
Quarter ended 30th Sept., 1903	46,729	55,644	20,677	359,387	2,428	14,660	31,927	531,452	307,877	839,329	3	15	0
Month of October, 1903 ...	6,044	10,283	9,304	127,762	1,946	5,537	15,353	176,229	88,102	264,331	1	3	5
Do. November, 1903 ...	23,737	6,211	7,665	143,307	11,854	6,518	9,394	208,686	79,995	288,681	1	5	6
Do December, 1903 ...	49,925	6,116	7,906	140,519	6,458	5,300	21,839	238,063	81,685	319,748	1	8	2
Quarter ended 31st Dec., 1903	79,706	22,610	24,875	411,588	20,258	17,355	46,586	622,978	249,782	872,760	3	17	1
Half-year ended 31st Dec., 1903	126,435	78,254	45,552	770,975	22,686	32,015	78,513	1,154,430	557,659	1,712,089	7	12	1
Month of January, 1904 ...	15,385	5,744	9,818	136,190	5,425	5,737	9,395	187,694	98,343	286,037	1	5	2
Do. February, 1904 ...	20,806	12,780	18,053	145,690	7,264	4,820	10,753	220,166	90,756	310,922	1	7	2
Do. March, 1904	12,423	51,301	10,088	125,642	12,091	5,448	16,676	233,669	90,269	323,938	1	8	1
Quarter ended 31st March, 1904	48,614	69,825	37,959	407,522	24,780	16,005	36,824	641,529	279,368	920,897	4	0	5
Month of April, 1904	9,454	11,796	9,564	129,573	6,429	5,810	11,535	184,161	76,553	260,714	1	2	5
Do. May, 1904	31,477	6,688	11,845	128,197	10,049	4,686	12,736	205,678	77,302	282,980	1	4	1
Eleven months ended 31st May, 1904	215,980	166,563	104,920	1,436,267	63,944	58,516	139,608	2,185,798	990,882	3,176,680	13	19	0

Digitized by Google

No. 7.—*Details of State Expenditure of Western Australia.*

Period.	Interest and Sinking Funds on Public Debt.	Railways and Tramways.	Public Works and Buildings.	Mines.	Police.	Education.	Medical.	Charities.	All other Expenditure.	Total State Expenditure.	Total State Expenditure per head of mean population.
	£	£	£	£	£	£	£	£	£	£	£ s. d.
Year ended 30th June, 1902 ...	602,138	1,269,619	273,522	101,958	123,724	102,359	90,115	26,227	561,765	3,151,427	16 0 11
Do. do. 1903 ...	692,692	1,275,565	428,051	119,962	130,308	120,305	88,794	30,033	636,053	3,521,763	16 8 8
Month of July, 1903	59,400	87,911	14,826	7,700	8,848	8,830	5,762	869	35,857	230,003	1 0 8
Do. August, 1903	55,948	117,945	33,069	16,173	10,859	9,543	7,528	2,645	48,804	302,514	1 7 0
Do. September, 1903 ...	59,600	101,532	43,022	16,144	10,388	11,927	7,705	2,580	52,229	305,127	1 7 2
Quarter ended 30th Sept., 1903 ...	174,948	307,388	90,917	40,017	30,095	30,300	20,995	6,094	136,890	837,644	3 14 10
Month of October, 1903	59,600	98,324	48,594	20,373	10,028	10,460	6,892	2,610	52,555	309,436	1 7 6
Do. November, 1903 ...	59,600	97,877	27,625	20,433	11,665	11,991	7,891	3,599	48,687	289,368	1 5 6
Do. December, 1903 ...	59,112	99,326	48,473	18,136	10,225	11,178	7,493	2,170	54,568	310,681	1 7 5
Quarter ended 31st Dec., 1903 ...	178,312	295,527	124,692	58,942	31,918	33,629	22,276	8,379	155,810	909,485	4 0 5
Half-year ended 31st Dec., 1903...	353,260	602,915	215,609	98,959	62,013	63,929	43,271	14,473	292,700	1,747,129	7 15 3
Month of January, 1904	59,800	97,194	27,465	13,899	12,369	8,915	8,085	2,746	49,174	279,647	1 4 7
Do. February, 1904 ...	60,630	107,824	68,796	10,132	10,014	10,553	7,701	2,629	52,110	330,389	1 8 11
Do. March, 1904	60,630	107,232	47,469	16,571	10,394	12,158	7,704	3,137	52,261	317,556	1 7 7
Quarter ended 31st March, 1904 ...	181,060	312,250	143,730	40,602	32,777	31,626	23,490	8,512	153,545	927,592	4 1 1
Month of April, 1904	60,630	124,973	39,056	15,140	9,925	11,413	7,556	2,361	59,919	330,973	1 8 6
Do. May, 1904	60,630	112,608	56,100	12,726	9,349	12,682	7,535	2,710	73,503	347,843	1 9 8
Eleven months ended 31st May, 1904	655,580	1,152,746	454,495	167,427	114,064	119,650	81,852	28,056	579,667	3,353,537	14 14 6

Digitized by Google

No. 8.—*Total Revenue and Expenditure of Western Australia (State and Commonwealth combined).*

Period.	Total Revenue.		Total Expenditure.		Excess of	
	Amount.	Per head of mean population.	Amount.	Per head of mean population.	Revenue.	Expen diture.
	£	£ s. d.	£	£ s. d.	£	£
Year ended 30th June, 1894	681,246	10 2 9	656,357	9 15 4	24,889	...
Do. do. 1895	1,125,941	13 13 4	936,729	11 7 5	189,212	...
Do. do. 1896	1,858,695	17 15 5	1,823,863	17 8 9	34,832	...
Do. do. 1897	2,842,751	20 4 5	2,839,453	20 3 11	3,298	...
Do. do. 1898	2,754,747	16 15 10	3,256,912	19 17 1	...	502,165
Do. do. 1899	2,478,811	14 13 5	2,539,358	15 0 7	...	60,547
Do. do. 1900	2,875,396	16 13 10	2,615,675	15 3 8	259,721	...
Do. do. 1901	3,080,580	16 18 11	3,164,147	17 8 1	...	83,567
Do. do. 1902	3,690,585	18 15 10	3,491,016	17 15 6	199,569	...
Do. do. 1903	3,996,469	18 12 11	3,886,802	18 2 9	109,667	...
Nine months ended 31st March, 1904 * ...	2,947,068	13 0 5	2,992,498	13 4 5	...	45,430

* Commonwealth details for April and May not yet available.

Digitized by Google

No. 9.—*Commonwealth Revenue collected in respect of Western Australia.*

Period.	Taxation.			Post Office, Telegraph, and Telephone.	Other Sources.	Total collected by Commonwealth.
	Customs.	Excise.	Total.			
	£	£	£	£	£	£
Year ended 30th June, 1902	1,273,125	62,489	1,335,614	225,752	172	1,561,538
Do. do. 1903	1,317,770	78,232	1,396,002	225,244	716	1,621,962
Month of July, 1903	110,006	5,126	115,132	24,847	127	140,106
Do. August, 1903	118,719	5,799	124,518	18,071	63	142,652
Do. September, 1903	95,318	5,552	100,870	18,221	Dr. (54)	119,037
Quarter ended 30th September, 1903 ...	324,043	16,477	340,520	61,139	136	401,795
Month of October, 1903	96,932	9,191	106,123	16,987	15	123,125
Do. November, 1903	92,568	9,904	102,472	16,249	17	118,738
Do. December, 1903	93,313	11,987	105,300	19,666	16	124,982
Quarter ended 31st December, 1903 ...	282,813	31,082	313,895	52,902	48	366,845
Half-year ended 31st December, 1903	606,856	47,559	654,415	114,041	184	768,640
Month of January, 1904	94,627	11,290	105,917	25,091	84	131,092
Do. February, 1904	91,850	9,897	101,747	18,197	55	119,999
Do. March, 1904	101,484	10,298	111,782	19,540	56	131,378
Quarter ended 31st March, 1904 ...	287,961	31,485	319,446	62,828	195	382,469
Nine months ended 31st March, 1904*	894,817	79,044	973,861	176,869	379	1,151,109

* Commonwealth details for April and May not yet available.

Digitized by Google

No. 10.—*Commonwealth Expenditure in respect of Western Australia.*

Period.	Customs Department.	Defence Department.	Post and Telegraph Department	Surplus Revenue returned to State.	All other Expenditure.	Total Commonwealth Expenditure.	Balance due to State at end of period.
	£	£	£	£	£	£	£
Year ended 30th June, 1902...	31,991	34,967	258,570	1,225,076	14,061	1,564,665	942
Do. do. 1903...	34,740	32,471	280,304	1,255,731	17,524	1,620,770	2,134
Month of July, 1903	2,571	1,491	22,067	109,436	1,673	137,238	5,002
Do. August, 1903 ...	3,501	8,509	22,701	110,772	1,602	147,085	569
Do. September, 1903 ...	3,041	989	23,659	87,669	2,735	118,093	1,513
Quarter ended 30th Sept., 1903	9,113	10,989	68,427	307,877	6,010	402,416	1,513
Month of October, 1903 ...	3,351	1,052	21,989	88,102	2,188	116,682	7,956
Do. November, 1903 ...	3,290	14,706	24,205	79,995	4,293	126,489	205
Do. December, 1903 ...	3,408	7,474	27,670	81,685	3,109	123,346	1,841
Quarter ended 31st Dec., 1903	10,049	23,232	73,864	249,782	9,590	366,517	1,841
Half-year ended 31st Dec., 1903	19,162	34,221	142,291	557,659	15,600	768,933	1,841
Month of January, 1904 ...	2,473	6,246	23,706	98,343	1,540	132,308	625
Do. February, 1904 ...	2,835	3,714	26,233	90,756	1,206	124,744	† 4,120
Do. March, 1904 ...	2,734	4,602	29,182	90,269	2,032	128,819	† 1,561
Quarter ended 31st Mar., 1904	8,042	14,562	79,121	279,368	4,778	385,871	†1,561
Nine months ended 31st * March, 1904	27,204	48,783	221,402	837,027	20,378	1,154,804	† 1,561

* Commonwealth figures for April and May not yet available. † Balance due to Commonwealth.

Digitized by Google

No. 11.—*Revenue and Expenditure of Western Australia (State and Commonwealth) per head of mean population.*

Period.	Revenue.			Expenditure.		
	State.*	Commonwealth.	Total.	State.	Commonwealth.*	Total.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Year ended 30th June, 1902	10 16 10	7 19 0	18 15 10	16 0 11	1 14 7	17 15 6
Do. do. 1903	11 1 7	7 11 4	18 12 11	16 8 8	1 14 1	18 2 9
Month of July, 1903	0 11 2	0 12 7	1 3 9	1 0 8	0 2 6	1 3 2
Do. August, 1903	0 14 10	0 12 9	1 7 7	1 7 0	0 3 3	1 10 3
Do. September, 1903	1 1 6	0 10 7	1 12 1	1 7 2	0 2 8	1 9 10
Quarter ended 30th September, 1903	2 7 6	1 15 11	4 3 5	3 14 10	0 8 5	4 3 3
Month of October, 1903	0 15 7	0 10 11	1 6 6	1 7 6	0 2 6	1 10 0
Do. November, 1903	0 18 6	0 10 6	1 9 0	1 5 6	0 4 2	1 9 8
Do. December, 1903	1 1 0	0 11 0	1 12 0	1 7 5	0 3 8	1 11 1
Quarter ended 31st December, 1903	2 15 1	1 12 5	4 7 6	4 0 5	0 10 4	4 10 9
Half-year ended 31st December, 1903	5 2 7	3 8 4	8 10 11	7 15 3	0 18 9	8 14 0
Month of January, 1904	0 16 6	0 11 7	1 8 1	1 4 7	0 3 0	1 7 7
Do. February, 1904	0 19 3	0 10 6	1 9 9	1 8 11	0 3 0	1 11 11
Do. March, 1904	1 0 3	0 11 5	1 11 8	1 7 7	0 3 4	1 10 11
Quarter ended 31st March, 1904 ...	2 16 0	1 13 6	4 9 6	4 1 1	0 9 4	4 10 5
Month of April, 1904	0 15 10	†	†	1 8 6	†	†
Do. May, 1904	0 17 6	†	†	1 9 8	†	†
Eleven months ended 31st May, 1904	9 11 11	†	†	14 14 6	†	†

* Exclusive of surplus Commonwealth Revenue returned to State. † Commonwealth figures for April and May not yet available.

Digitized by Google

No. 12.—*Public Debt of Western Australia in each of the Years 1894 to 1903; also Indebtedness per head of Estimated Population.*

Date.	Amount outstanding.				Average nominal rate of interest payable.	Gross Indebtedness per head of Population.	Amount of Accrued Sinking Fund.	Net Indebtedness.	
	Debentures.	Inscribed Stock.	Treasury Bills.	Total.				Amount.	Per head of Population.
	£	£	£	£	%	£ s. d.	£	£	£ s. d.
30th June, 1894	410,100	2,822,154	185,085	3,417,339	4·08	45 0 9	138,531	3,278,808	43 4 2
" " 1895	396,600	3,581,646	14,435	3,992,681	3·96	44 12 5	154,785	3,837,896	42 17 10
" " 1896	382,000	4,341,753	12,820	4,736,573	3·80	38 14 6	175,033	4,561,540	37 5 11
" " 1897	370,900	6,447,595	492,320	7,310,815	3·59	46 7 7	205,637	7,105,178	45 1 6
" " 1898	366,600	7,448,094	1,303,530	9,118,224	3·54	53 8 4	255,784	8,862,440	51 18 4
" " 1899	360,600	8,462,225	1,550,000	10,372,825	3·49	61 13 11	310,373	10,062,452	59 17 0
" " 1900	352,500	9,522,140	1,800,000	11,674,640	3·45	65 13 4	377,161	11,297,479	63 10 11
" " 1901	324,800	11,384,630	1,000,000	12,709,430	3·45	67 5 0	431,478	12,277,952	64 19 4
" " 1902	276,000	14,666,310	...	14,942,310	3·36	72 3 5	486,737	14,455,573	69 16 5
" " 1903	221,500	15,405,798	...	15,627,298	3·38	70 7 11	655,069	14,972,229	67 8 11
31st Dec., 1903	218,500	15,507,098	...	15,725,598	3·39	69 5 10	759,948	14,965,650	65 18 10

Digitized by Google

No. 13.—*Net Loan Expenditure on Public Works, etc., in each of the Years 1882 to 1903.**

(The amount shown in this table for any year is the Total Loan Expenditure for that year, less the amount credited for sales of materials, etc.)

Year.	Railways and Tramways.	Electric Telegraphs.	Harbours, Rivers, Light-houses, etc.	Roads and Bridges.	Public Buildings.	Water Supply and Sewerage.	Development of Goldfields and Mineral Resources.	Agricultural Surveys and Development.	Immigration.	Miscellaneous.	Total.
	£	£	£	£	£	£	£	£	£	£	£
Prior to 1882	274,320	73,277	19,016	33,358	885	...	...	...	...	...	400,856
Year 1882	29,946	...	550	8,356	81	...	...	...	...	...	38,933
Do. 1883	40,933	1,646	879	6,097	5,364	...	...	...	...	...	54,919
Do. 1884	138,645	19,505	2,460	1,609	1,233	...	...	...	...	...	163,452
Do. 1885	118,862	36,028	4,318	50	280	...	...	...	...	...	159,535
Do. 1886	107,630	8,267	10,029	52	1,527	1,540	...	...	...	...	129,048
Do. 1887	117,511	41,514	35,185	158	6,417	4,473	...	...	...	...	205,254
Do. 1888	6,953	18,348	8,383	...	8,714	1,406	...	...	...	...	43,808
Do. 1889	4,246	31,051	15,092	...	8,541	587	7,697	...	...	60,818	128,032
Do. 1890	1,497	3,105	3,011	...	4,795	759	2,239	...	...	500	15,906
Do. 1891	43,639	3,596	6,258	9,973	83	972	9,606	3,867	...	...	77,994
Do. 1892	258,017	11,673	55,847	17,568	723	136	13,202	8,000	4,064	...	369,230
Half-year ended 30th June, 1893	207,069	1,260	41,206	2,107	2,853	61	11,123	3,228	1,402	332	270,641
Year ended 30th June, 1894	505,427	28	70,474	2,188	5,790	17	67,907	4,214	2,699	446	659,190
Do. do. 1895	362,592	8,312	138,581	11,718	13,898	49	66,205	1,994	2,576	577	606,502
Do. do. 1896	409,121	11,698	194,937	12,242	59	...	7,056	13,236	2,359	...	650,708
Do. do. 1897	1,926,795	...	218,172	13,166	...	16,994	120,292	311,111	3,138	...	2,609,668
Do. do. 1898	1,385,794	...	208,392	13,635	2,633	75,757	201,007	3,833	4,737	357	1,896,145
Do. do. 1899	546,128	...	207,141	8,280	...	147,209	118,781	3,039	2,059	53	1,032,690
Do. do. 1900	151,111	...	197,488	731	...	474,615	52,613	1,343	338	90	878,329
Do. do. 1901	332,729	...	214,830	510	...	872,800	69,820	3,614	892	97	1,495,292
Do. do. 1902	578,985	...	182,962	740	...	731,989	37,267	10,365	3,433	82	1,545,823
Do. do. 1903	1,059,418	...	138,422	...	...	413,435	38,718	14,980	928	...	1,665,901
Total	8,607,368	269,308	1,973,633	142,538	63,876	2,742,799	823,533	382,824	28,625	63,352	15,097,856

The expenditure from Loans has been classified in this table under the headings made use of in the Schedules to the various Loan Acts, this being the method d by the Treasury. Information as to the total amount *actually* spent under some headings of Expenditure is consequently not obtainable, certain items being d under the indefinite heading "Development of Goldfields and Mineral Resources." "Electric Telegraphs" and "Water Supply and Sewerage" are probably fected by this classification.

Digitized by Google

No. 12.—*Public Debt of Western Australia in each of the Years 1894 to 1903; also Indebtedness per head of Estimated Population.*

Date.	Amount outstanding.				Average nominal rate of interest payable.	Gross Indebtedness per head of Population.	Amount of Accrued Sinking Fund.	Net Indebtedness.	
	Debentures.	Inscribed Stock.	Treasury Bills.	Total.				Amount.	Per head of Population.
	£	£	£	£	%	£ s. d.	£	£	£ s. d.
30th June, 1894	410,100	2,822,154	185,085	3,417,339	4·08	45 0 9	138,531	3,278,808	43 4 2
" " 1895	396,600	3,581,646	14,435	3,992,681	3·96	44 12 5	154,785	3,837,896	42 17 10
" " 1896	382,000	4,341,753	12,820	4,736,573	3·80	38 14 6	175,033	4,561,540	37 5 11
" " 1897	370,900	6,447,595	492,320	7,310,815	3·59	46 7 7	205,637	7,105,178	45 1 6
" " 1898	366,600	7,448,094	1,303,530	9,118,224	3·54	53 8 4	255,784	8,862,440	51 18 4
" " 1899	360,600	8,462,225	1,550,000	10,372,825	3·49	61 13 11	310,373	10,062,452	59 17 0
" " 1900	352,500	9,522,140	1,800,000	11,674,640	3·45	65 13 4	377,161	11,297,479	63 10 11
" " 1901	324,800	11,384,630	1,000,000	12,709,430	3·45	67 5 0	431,478	12,277,952	64 19 4
" " 1902	276,000	14,666,310	...	14,942,310	3·36	72 3 5	486,737	14,455,573	69 16 5
" " 1903	221,500	15,405,798	...	15,627,298	3·38	70 7 11	655,069	14,972,229	67 8 11
31st Dec., 1903	218,500	15,507,098	...	15,725,598	3·39	69 5 10	759,948	14,965,650	65 18 10

Digitized by Google

No. 13.—*Net Loan Expenditure on Public Works, etc., in each of the Years 1882 to 1903.**

(The amount shown in this table for any year is the Total Loan Expenditure for that year, less the amount credited for sales of materials, etc.)

Year.	Railways and Tramways.	Electric Telegraphs.	Harbours, Rivers, Light-houses, etc.	Roads and Bridges.	Public Buildings.	Water Supply and Sewerage.	Development of Goldfields and Mineral Resources.	Agricultural Surveys and Development.	Immigration.	Miscellaneous.	Total.
	£	£	£	£	£	£	£	£	£	£	£
Prior to 1882	274,320	73,277	19,016	33,358	885	...	...	...	...	...	400,856
Year 1882	29,946	...	550	8,356	81	...	...	...	...	...	38,933
Do. 1883	40,933	1,646	879	6,097	5,364	...	...	...	...	...	54,919
Do. 1884	138,645	19,505	2,460	1,609	1,233	...	...	...	...	...	163,452
Do. 1885	118,862	36,028	4,318	50	280	...	...	...	...	...	159,535
Do. 1886	107,630	8,267	10,029	52	1,527	1,540	...	...	...	...	129,048
Do. 1887	117,511	41,514	35,185	158	6,417	4,473	...	...	...	...	205,254
Do. 1888	6,953	18,348	8,383	...	8,714	1,406	...	...	...	...	43,808
Do. 1889	4,246	31,051	15,092	...	8,541	587	7,697	...	...	60,818	128,032
Do. 1890	1,497	3,105	3,011	...	4,795	759	2,239	...	...	500	15,906
Do. 1891	43,639	3,596	6,258	9,973	83	972	9,606	3,867	...	...	77,994
Do. 1892	258,017	11,673	55,847	17,568	723	136	13,202	8,000	4,064	...	369,230
Half-year ended 30th June, 1893	207,069	1,260	41,206	2,107	2,853	61	11,123	3,228	1,402	332	270,641
Year ended 30th June, 1894	505,427	28	70,474	2,188	5,790	17	67,907	4,214	2,699	446	659,190
Do. do. 1895	362,592	8,312	138,581	11,718	13,898	49	66,205	1,994	2,576	577	606,502
Do. do. 1896	409,121	11,698	194,937	12,242	59	...	7,056	13,236	2,359	...	650,708
Do. do. 1897	1,926,795	...	218,172	13,166	...	16,994	120,292	311,111	3,138	...	2,609,668
Do. do. 1898	1,385,794	...	208,392	13,635	2,633	75,757	201,007	3,833	4,737	357	1,896,145
Do. do. 1899	546,128	...	207,141	8,280	...	147,209	118,781	3,039	2,059	53	1,032,690
Do. do. 1900	151,111	...	197,488	731	...	474,615	52,613	1,343	338	90	878,329
Do. do. 1901	332,729	...	214,830	510	...	872,800	69,820	3,614	892	97	1,495,292
Do. do. 1902	578,985	...	182,962	740	...	731,989	37,267	10,365	3,433	82	1,545,823
Do. do. 1903	1,059,418	...	138,422	...	...	413,435	38,718	14,980	928	...	1,665,901
Total	8,607,368	269,308	1,973,633	142,538	63,876	2,742,799	823,533	382,824	28,625	63,352	15,097,856

* The expenditure from Loans has been classified in this table under the headings made use of in the Schedules to the various Loan Acts, this being the method adopted by the Treasury. Information as to the total amount *actually* spent under some headings of Expenditure is consequently not obtainable, certain items being included under the indefinite heading "Development of Goldfields and Mineral Resources." "Electric Telegraphs" and "Water Supply and Sewerage" are probably most affected by this classification.

Digitized by Google

No. 14.—*Transactions of the Post Office Savings Bank since 1894.*

Period.	Deposits.	Withdrawals.	Excess of Deposits over Withdrawals.	Interest.	Number of Accounts			Amount due to Depositors at end of period (inclusive of interest in the annual returns).	Average amount standing to the credit of each Account remaining open at end of period.
					Opened.	Closed.	Remaining open at end of period.		
	£	£	£	£	No.	No.	No.	£	£ s. d.
Year ended 30th June, 1894 ...	146,387	83,509	62,878	3,516	3,970	2,405	6,310	141,320	22 7 11
Do. do. 1895 ...	217,930	143,679	74,251	6,245	5,452	3,388	8,374	221,816	26 9 9
Do. do. 1896 ...	520,016	291,744	228,272	10,523	14,250	6,464	16,160	460,611	28 10 1
Do. do. 1897 ...	1,068,322	690,183	378,139	17,334	24,783	14,626	26,317	856,084	32 10 7
Do. do. 1898 ...	1,231,638	1,042,521	189,117	26,857	23,865	20,391	29,791	1,072,058	35 19 9
Do. do. 1899 ...	1,057,023	1,042,751	14,272	29,848	17,972	18,392	29,371	1,116,178	38 0 1
Do. do. 1900 ...	1,112,251	962,371	149,880	33,086	18,406	14,131	33,646	1,299,144	38 12 3
Do. do. 1901 ...	1,333,376	1,053,938	279,438	39,777	20,244	14,572	39,318	1,618,359	41 2 9
Do. do. 1902 ...	1,534,010	1,311,347	222,663	48,060	22,355	16,565	45,108	1,889,082	41 17 7
Do. do. 1903 ...	1,605,148	1,559,647	45,501	54,042	22,255	19,345	48,018	1,988,625	41 8 3
Month of July, 1903	146,706	131,270	15,436	* 3	1,874	1,370	48,522	2,004,064	41 6 1
Do. August, 1903 ..	138,023	127,174	10,849	* 90	1,802	1,161	49,163	2,015,003	40 19 9
Do. September, 1903 ...	140,604	127,998	12,606	* 165	1,875	1,120	49,918	2,027,774	40 12 5
Do. October, 1903 ...	132,028	130,722	1,306	* 268	1,747	1,229	50,436	2,029,348	40 4 9
Do. November, 1903 ...	135,818	136,685	† 867	* 397	1,661	1,245	50,852	2,028,878	39 17 11
Do. December, 1903 ...	120,895	159,256	† 38,361	* 455	1,287	1,436	50,703	1,990,972	39 5 4
Do. January, 1904 ...	134,532	139,229	† 4,697	* 533	2,820	1,266	52,257	1,986,808	38 0 5
Do. February, 1904 ...	129,273	136,473	† 7,200	* 584	1,778	1,195	52,840	1,980,192	37 9 6
Do. March, 1904 ...	144,539	139,561	4,978	* 692	1,992	1,238	53,594	1,985,862	37 1 1
Do. April, 1904	133,077	122,601	10,476	* 692	1,874	1,179	54,289	1,997,030	36 15 8
Do. May, 1904	142,699	128,103	14,596	* 720	1,990	1,100	55,179	2,012,346	36 9 5

* Interest on accounts closed during month. † Excess of withdrawals over deposits.

Digitized by Google

No. 15.—*Averages since 1894 of the Weekly Statements of Liabilities and Assets of the Banks of Issue operating in Western Australia.*

Period.	No. of Banks.	Liabilities.						
		Notes in Circulation.	Bills in Circulation.	Balances due to other Banks.	Deposits.			Total Average Liabilities.
					Not bearing Interest.	Bearing Interest.	Total.	
		£	£	£	£	£	£	£
ear 1894	6	143,156	25,458	8,020	751,430	877,872	1,629,302	1,805,936
Do. 1895	6	214,679	57,465	15,185	1,593,372	996,355	2,589,727	2,877,056
Do. 1896	6	395,092	85,382	25,403	3,192,348	1,385,048	4,577,396	5,083,273
Do. 1897	6	374,993	75,396	68,774	3,096,105	973,562	4,069,667	4,588,830
Do. 1898	6	330,673	60,040	45,363	2,576,783	1,024,393	3,601,176	4,037,252
Do. 1899	6	315,189	34,658	38,507	2,547,152	1,261,477	3,808,629	4,196,983
Do. 1900	6	361,716	34,279	50,380	2,869,480	1,521,031	4,390,511	4,836,886
Do. 1901	6	378,372	40,735	73,172	2,980,390	1,456,373	4,436,763	4,929,042
Do. 1902	6	394,011	38,120	72,731	3,202,695	1,593,019	4,795,714	5,300,576
Do. 1903	6	387,920	52,930	67,309	3,311,939	1,480,151	4,792,090	5,300,249
Quarter ended 31st March, 1904	6	358,492	52,016	62,003	3,334,351	1,466,089	4,800,440	5,272,951

(*Continued on next page.*)

Digitized by Google

No. 15.—*Averages since 1894 of the Weekly Statements of Liabilities and Assets of the Banks of Issue operating in Western Australia*—continued.

Period.	Assets.							
	Coined Gold, Silver, and other metals.	Gold and Silver, in Bullion and Bars.	Government Securities.	Landed Property and Bank Premises.	Notes and Bills of other Banks.	Balances due from other Banks.	Notes and Bills discounted and other Debts to Banks not before enumerated.	Total Average Assets.
	£	£	£	£	£	£	£	£
Year 1894 ...	636,973	52,418	7,500	105,059	16,869	18,834	2,118,429	2,956,082
Do. 1895 ...	1,200,582	76,894	7,500	103,625	31,199	142,987	2,385,662	3,948,449
Do. 1896 ...	2,323,962	90,657	13,750	111,421	58,708	343,430	2,812,547	5,754,475
Do. 1897 ...	2,102,831	132,165	116,000	136,481	37,328	104,187	3,349,806	5,978,798
Do. 1898 ...	1,631,604	195,640	58,488	158,266	41,049	128,998	3,206,434	5,420,479
Do. 1899 ...	1,527,902	238,484	43,118	181,199	53,343	124,523	2,817,465	4,986,034
Do. 1900 ...	2,231,438	251,202	66,862	198,626	63,457	173,555	2,756,872	5,742,012
Do. 1901 ...	2,056,540	321,515	81,689	202,238	63,506	157,951	3,061,330	5,944,769
Do. 1902 ...	2,265,767	506,771	100,450	211,590	57,545	73,332	3,224,106	6,439,561
Do. 1903 ...	1,621,037	622,591	91,222	202,191	64,004	120,257	3,650,685	6,371,987
Quarter ended 31st March, 1904 ...	1,469,433	598,750	107,316	199,380	66,299	49,300	3,742,808	6,233,786

Digitized by Google

III.—SHIPPING.

No. 16.—*Number and Tonnage of Vessels entered and cleared at Western Australian Ports from and to Ports outside the State in each Year since 1894.*

(Compiled from Returns furnished by Clayton T. Mason, Collector of Customs.)

Year.	Inwards.		Outwards.		Inwards and Outwards.	
	Vessels.	Tons.	Vessels.	Tons.	Vessels.	Tons.
1894	372	675,775	349	653,303	721	1,329,078
1895	485	814,368	433	764,185	918	1,578,553
1896	768	1,105,907	683	1,030,471	1,451	2,136,378
1897	721	1,196,760	707	1,181,072	1,428	2,377,832
1898	633	1,199,894	631	1,189,732	1,264	2,389,626
1899	685	1,333,052	668	1,305,596	1,353	2,638,648
1900	769	1,625,696	747	1,606,332	1,516	3,232,028
1901	884	1,842,236	901	1,872,027	1,785	3,714,263
1902	763	1,671,169	765	1,686,905	1,528	3,358,074
1903	708	1,673,154	703	1,662,741	1,411	3,335,895

Digitized by Google

IV.—TRADE.

(Compiled from Returns supplied by Clayton T. Mason, Collector of Customs.)

No. 17.—*Value of Imports into Western Australia in each Year since 1894.*

Imports from	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.
	£	£	£	£	£	£	£	£	£	£
United Kingdom	611,308	943,477	2,057,635	2,624,086	2,051,872	1,550,029	2,225,746	2,566,162	3,350,644	2,599,142
Commonwealth of Australia	1,373,610	2,701,797	4,084,985	3,255,252	2,734,660	2,303,844	2,675,156	2,559,020	2,046,701	2,541,368
New Zealand	461	745	20,157	22,048	9,101	8,513	68,346	124,172	274,302	163,381
Other British Possessions ...	62,056	92,062	203,425	210,100	165,123	163,190	279,593	245,532	183,667	151,970
Total, British ...	2,047,435	3,738,081	6,366,202	6,111,486	4,960,756	4,025,576	5,248,841	5,494,886	5,855,314	5,455,861
Foreign Countries	66,979	36,870	127,355	307,079	281,209	447,956	713,337	959,285	1,363,038	1,314,061
Grand Total	2,114,414	3,774,951	6,493,557	6,418,565	5,241,965	4,473,532	5,962,178	6,454,171	7,218,352	6,769,922
Value of Imports per head of Mean Population ...	£ s. d. 28 3 5	£ s. d. 41 17 6	£ s. d. 52 18 6	£ s. d. 41 5 2	£ s. d. 31 0 4	£ s. d. 26 10 11	£ s. d. 33 14 0	£ s. d. 34 5 6	£ s. d. 35 1 8	£ s. d. 30 11 11

Digitized by Google

No. 18.—*Value of Exports from Western Australia in each Year since 1894.*

Exports to	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.
	£	£	£	£	£	£	£	£	£	£
United Kingdom	330,216	328,125	508,755	1,736,205	2,293,652	3,774,247	4,268,419	5,625,459	4,364,910	4,071,968
Commonwealth of Australia	829,386	932,018	962,959	1,979,163	2,462,656	2,937,431	1,125,031	574,622	798,750	866,607
New Zealand	13	...	...	1,055	305	143	307	9,793	5,415	33,956
Other British Possessions ...	86,288	50,839	120,026	158,457	138,692	191,554	1,214,756	1,987,702	3,285,111	5,073,844
Total, British ...	1,245,993	1,310,982	1,591,740	3,874,880	4,895,305	6,903,375	6,608,513	8,197,576	8,454,186	10,046,375
Foreign Countries	5,503	21,572	58,486	65,218	64,701	82,267	243,541	318,047	597,172	278,357
Grand Total	1,251,406	1,332,554	1,650,226	3,940,098	4,960,006	6,985,642	6,852,054	8,515,628	9,051,358	10,324,732
Value of Exports per head of Mean Population ...	£ s. d. 16 13 5	£ s. d. 14 15 8	£ s. d. 13 9 0	£ s. d. 25 6 7	£ s. d. 29 7 0	£ s. d. 41 9 0	£ s. d. 38 14 8	£ s. d. 45 4 5	£ s. d. 43 19 10	£ s. d. 46 13 2

Digitized by Google

No. 19.—*Total Trade (Value of Imports and Exports combined) of Western Australia in each Year since 1894.*

Total rade with	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.
	£	£	£	£	£	£	£	£	£	£
United Kingdom	941,524	1,271,602	2,566,390	4,360,291	4,345,524	5,324,276	6,494,165	8,191,621	7,715,554	6,671,110
Commonwealth of Australia	2,202,996	3,633,815	5,047,944	5,234,415	5,197,316	5,241,275	3,800,187	3,133,642	2,845,451	3,407,975
New Zealand	474	745	20,157	23,103	9,406	8,656	68,653	133,965	279,717	197,337
Other British Possessions ...	148,344	142,901	323,451	368,557	303,815	354,744	1,494,349	2,233,234	3,468,778	5,225,814
Total, British ...	3,293,338	5,049,063	7,957,942	9,986,366	9,856,061	10,928,951	11,857,354	13,692,462	14,309,500	15,502,236
Foreign Countries	72,482	58,442	185,841	372,297	345,910	530,223	956,878	1,277,332	1,960,210	1,592,418
Grand Total	3,365,820	5,107,505	8,143,783	10,358,663	10,201,971	11,459,174	12,814,232	14,969,794	16,269,710	17,094,654
Value of Total Trade per head of Mean Population ...	£ s. d. 44 16 10	£ s. d. 56 13 2	£ s. d. 66 7 6	£ s. d. 66 11 9	£ s. d. 60 7 4	£ s. d. 67 19 11	£ s. d. 72 8 8	£ s. d. 79 9 11	£ s. d. 79 1 6	£ s. d. 77 5 1

Digitized by Google

No. 20.—*Value of Imports, Exports, and Total Trade of the Various Ports of Western Australia.*

Ports.	1901.			1902.			1903.		
	Value of Imports.	Value of Exports.	Value of Total Trade.	Value of Imports.	Value of Exports.	Value of Total Trade.	Value of Imports.	Value of Exports.	Value of Total Trade.
	£	£	£	£	£	£	£	£	£
Fremantle	4,774,774	7,395,032	12,169,806	5,184,813	6,841,947	12,026,760	4,686,613	8,411,584	13,098,197
Perth	1,215,235	9,992	1,225,227	1,586,733	8,588	1,595,321	1,596,328	17,789	1,614,117
Albany	182,609	394,181	576,790	158,922	1,336,204	1,495,126	159,336	793,791	953,127
Geraldton	137,086	126,972	264,058	127,397	155,742	283,139	138,668	109,993	248,661
Bunbury	42,280	140,158	182,438	56,508	251,962	272,470	63,621	448,510	512,131
Broome...	33,083	117,808	150,891	40,760	169,818	210,578	55,696	196,245	251,941
Cossack...	14,864	77,671	92,535	10,913	64,311	75,224	13,704	55,158	68,862
Vasse and Hamelin ...	14,379	68,906	83,285	12,776	34,660	47,436	8,232	44,082	52,314
Carnarvon	6,453	60,694	67,147	8,780	77,472	86,252	6,766	85,540	92,306
Port Hedland	7,026	56,784	63,810	10,441	43,067	53,508	8,992	54,347	63,339
Derby	2,692	28,506	31,198	2,320	40,976	43,296	3,772	38,942	42,714
Onslow	1,624	25,035	26,659	3,988	51,146	55,134	3,173	56,475	59,648
Esperance	6,918	12,960	19,878	8,071	13	8,084	20,767	12,188	32,955
Eucla	10,108	902	11,010	1,520	616	2,136			
Wyndham	2,603	22	2,625	2,730	10,836	13,566	3,181	88	3,269
Dongara	2,437	...	2,437	1,680	...	1,680	1,073	...	1,073
TOTAL	6,454,171	8,515,623	14,969,794	7,218,352	9,051,358	16,269,710	6,769,922	10,324,732	17,094,654

Digitized by Google

No. 21.—*Value of the Imports of Western Australia in each year since 1894, distinguishing the more important articles or groups of articles.*

Articles.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.
	£	£	£	£	£	£	£	£	£	£
Meat and Fish (fresh and preserved)	52,426	64,434	119,867	114,184	96,296	93,947	113,748	118,833	146,263	212,401
Spirits, Beer, and Wine	125,714	179,431	310,684	342,870	228,718	171,676	236,783	219,780	289,271	236,284
Tobacco, Cigars, and Cigarettes	31,309	53,545	93,809	101,617	89,470	86,270	96,423	101,263	119,527	167,167
Live Stock	58,999	116,961	200,361	270,637	257,608	193,012	225,891	251,780	277,591	263,895
Bacon, Hams, Tongues, Butter, Cheese, Eggs, and Tinned Milk	102,314	171,690	329,569	423,026	430,672	407,434	481,092	524,114	650,684	631,278
Sugar	55,178	54,239	92,635	105,366	111,085	112,745	128,889	132,539	143,758	159,930
Wearing Apparel, Drapery, Piece Goods, Hats and Bonnets, Blankets, Boots and Shoes, Sewing Silks and Cottons ...	277,046	435,412	649,936	763,329	609,412	544,334	792,690	777,192	996,276	935,455
Timber, Cement, and Furniture	35,649	83,541	223,758	254,240	107,393	85,254	102,181	232,183	173,344	209,885
Ammunition and Explosives	19,558	32,722	86,737	92,389	85,684	96,262	157,536	153,271	190,027	194,370
Oils	15,957	20,066	48,181	61,132	51,872	70,774	93,865	122,435	81,494	101,0[illegible]9
Machines, Machinery, Pumps, Apparatus for raising water, and Tools	114,075	260,771	667,154	493,049	496,223	494,235	643,490	629,637	784,893	869,116
Iron, Steel, Ironmongery, Metal and Metalware, Cutlery, Hardware, Nails, Screws, etc.	126,060	176,385	4[illegible]3,877	479,226	384,502	421,415	700,859	610,386	609,545	712,978
Wheat, Flour, Oats, Oatmeal, Malt, Bran and Pollard, Potatoes, and Onions	126,538	253,208	434,283	502,542	454,508	288,913	269,170	382,362	446,548	441,241
Jams, Jellies, and Fruits	40,689	60,515	10[illegible],901	122,703	107,726	112,533	119,397	117,920	119,797	127,364
Tea	41,912	36,440	59,957	56,174	65,417	65,257	70,334	88,160	69,790	71,694
Coal and Coke	21,796	29,581	4[illegible],000	97,103	93,114	97,112	125,958	186,015	159,589	73,847
Paper, Books, and Stationery	30,465	51,809	84,904	99,207	94,974	78,797	103,590	108,167	133,161	156,097
Cyanide	..	...	1,280	7,531	36,773	55,849	129,964	114,819	161,191	170,646
Jewellery, Clocks and Watches, and Fancy Goods	13,733	27,310	49,779	49,328	53,675	38,313	54,916	65,406	85,216	93,204
Drugs, Chemicals, and Medicines	22,654	34,750	55,557	66,156	51,992	45,496	53,218	59,617	65,017	81,885
All other Articles	799,310	1,626,141	2,410,278	1,916,754	1,334,821	913,934	1,262,164	1,428,292	1,515,370	860,076
TOTAL	2,114,414	3,774,951	6,498,557	6,418,565	5,241,965	4,473,532	5,962,178	6,454,171	7,218,352	6,769,922

Digitized by Google

No. 22.—*Value of the Exports of Western Australia in each Year since 1894, distinguishing the most important articles.*

Period.	Gold Specie. (Including from 1899 exports of local Gold coined at Perth Mint.)*	Value of principal articles of Export, being the produce of Western Australia.								All other Articles.	Total Exports.
		† Raw Gold.	Wool.	Timber.	Hides and Skins.	Pearls and Shell.	Sandal-wood.	Copper (Ingot, Ore, and Matte).	Tin (Ingot and Ore).		
	£	£	£	£	£	£	£	£	£	£	£
1894	...	787,099	232,201	74,804	14,878	62,805	23,430	...	15,274	40,915	1,251,406
1895	4,500	879,748	183,510	88,146	18,941	47,501	30,863	12,952	9,703	56,690	1,332,554
1896	92	1,068,808	267,506	116,420	18,569	50,740	65,800	100	4,338	57,853	1,650,226
1897	626,080	2,564,977	295,646	192,451	37,996	60,486	49,480	1,033	3,275	108,664	3,940,098
1898	15,000	3,990,698	287,731	326,195	60,226	99,009	31,812	4,266	2,760	142,309	4,960,006
1899	* 79,692	5,451,368	423,296	553,198	82,981	110,667	29,719	41,452	23,168	190,106	6,985,642
1900	* 1,750,763	3,799,116	270,718	458,461	74,902	106,607	39,038	33,987	57,050	261,462	6,852,054
1901	* 2,807,841	3,941,797	378,135	572,354	86,559	130,730	73,931	110,769	52,102	361,405	8,515,623
1902	* 4,149,869	3,318,958	458,078	500,523	111,456	178,699	61,771	12,904	30,398	219,692	9,051,358
1903	* 4,556,192	4,061,767	443,743	619,705	128,580	224,322	27,913	37,815	52,132	162,562	10,324,732

* The exact amount, being Western Australian mintage, cannot be ascertained with any accuracy. † For Total Production of Gold see Table No. 27, pp. 490 and 491.

Digitized by Google

V.—GOVERNMENT RAILWAYS.

(Compiled from Returns furnished by W. J. George, Commissioner of Railways.)

No. 23.—*Traffic and Rolling Stock of Government Railways of Western Australia since 1894.*

Year.	Length.		Traffic.			Rolling Stock.			
	Average worked during the Year.	Open at the end of the Year.	No. of Train Miles run.	Passengers carried.	Goods carried.	Locomotives.	Passenger * Carriages.	† Wagons and Brake Vans.	Total Number.
	Miles.	Miles.	No.	No.	Tons.	No.	No.	No.	No.
Year ended 30th June, 1894	321	321	641,080	617,080	204,686	41	53	1,052	1,146
Do. do. 1895	550	573	997,540	1,022,248	255,839	49	75	1,459	1,583
Do. do. 1896	580	588	1,541,750	1,679,816	435,757	74	102	2,360	2,536
Do. do. 1897	830	970	2,537,192	3,607,486	858,748	151	224	3,485	3,860
Do. do. 1898	974	993	3,613,874	5,669,444	1,203,911	186	289	4,478	4,953
Do. do. 1899	1,270	1,355	3,257,871	5,872,200	1,148,252	231	343	4,558	5,132
Do. do. 1900	1,355	1,355	4,216,161	6,225,068	1,384,040	233	260	4,777	5,270
Do. do. 1901	1,355	1,355	4,126,202	6,823,453	1,719,720	229	258	4,819	5,306
Do. do. 1902	1,356	1,360	4,507,919	8,158,299	2,040,092	274	260	5,285	5,819
Do. do. 1903	1,434	1,516	4,611,315	9,106,396	1,968,331	316	264	5,694	6,274

* Including Passenger Brake Vans up to 30th June, 1899. † Exclusive of Passenger Brake Vans up to 30th June, 1899.

Digitized by Google

No. 24.—*Revenue and Expenditure of the Government Railways of Western Australia since 1894.*

Year ended.	Gross Earnings.						Working Expenses.				Result of Traffic (irrespective of interest on cost of construction).			
											Net Earnings.			
	Passenger Fares.	Goods, Live Stock, Parcels, and Wharfage.	Miscellaneous, including Rents, Mails, etc.	Total Amount.	Per Average Mile Worked.	Per Train Mile Run.	Total Amount.	Per cent. of Gross Earnings.	Per Average Mile Worked.	Per Train Mile Run.	Amount.	Per cent. of Cost of Construction.	Per Average Mile Worked.	Per Train Mile Run.
	£	£	£	£	£	d.	£	%	£	d.	£	%	£	d.
30th June, 1894 ...	47,804	80,669	12,091	140,564	438	52·59	103,972	73·96	324	38·90	36,591	3·12	114	13·69
30th June, 1895 ...	107,278	181,695	7,027	296,000	538	71·22	182,045	61·50	331	43·79	113,954	5·44	207	27·43
30th June, 1896 ...	150,597	352,597	26,422	529,616	913	82·44	263,704	49·79	455	41·05	265,912	11·48	458	41·39
30th June, 1897 ...	303,124	572,715	39,644	915,483	1,103	86·59	577,655	63·09	696	54·64	337,828	9·04	407	31·95
30th June, 1898 ...	345,174	646,695	27,808	1,019,677	1,047	67·72	786,318	77·11	807	52·22	233,359	4·62	240	15·50
30th June, 1899 ...	312,685	655,863	36,073	1,004,620	791	74·01	712,329	70·91	561	52·48	292,291	4·55	230	21·53
30th June, 1900 ...	342,469	884,843	32,200	1,259,512	930	71·70	861,470	68·40	636	49·04	398,042	5·81	294	22·66
30th June, 1901 ...	341,479	971,318	40,907	1,353,704	999	78·74	1,044,920	77·19	771	60·78	308,784	4·35	228	17·96
30th June, 1902 ...	381,295	1,085,897	54,237	1,521,429	1,122	81·00	1,256,370	82·58	927	66·89	265,059	3·58	195	14·11
30th June, 1903 ...	380,721	1,103,052	69,712	1,553,485	1,083	80·85	1,247,873	80·33	870	64·95	305,612	3·75	213	15·90

Digitized by Google

No. 27.—*Annual Gold Production of Western Australia since* 1886, *comprising Raw Gold entered for Export, plus Raw Gold received at the Perth Branch of the Royal Mint (from May,* 1899).

(Compiled from Returns supplied by Clayton T. Mason, Collector of Customs; H. S. King, Under Secretary for Mines; and J. F. Campbell, Deputy Master of Perth Branch of Royal Mint.)

Period.	Quantity of Raw Gold.				Value.
	Exported.	Received at Perth Mint.	Total.		
	Crude ounces.	Crude ounces.	Crude ounces.	Fine ounces.	£
Year 1886	302	..	302	270	1,148
Do. 1887	4,873	..	4,873	4,359	18,517
Do. 1888	3,493	..	3,493	3,125	13,273
Do. 1889	15,493	..	15,493	13,860	58,874
Do. 1890	22,806	..	22,806	20,402	86,663
Do. 1891	30,311	..	30,311	27,116	115,182
Do. 1892	59,548	..	59,548	53,271	226,282
Do. 1893	110,891	..	110,891	99,203	421,386
Do. 1894	207,131	..	207,131	185,298	787,098
Do. 1895	231,513	..	231,513	207,111	879,749
Do. 1896	281,265	..	281,265	251,618	1,068,807
Do. 1897	674,994	..	674,994	603,847	2,564,977
Do. 1898	1,050,184	..	1,050,184	939,490	3,990,699
Do. 1899	1,434,570	209,307	1,643,877	1,470,605	6,246,733
Do. 1900	999,767	581,183	1,580,950	1,414,311	6,007,610
Do. 1901	1,019,109	860,281	1,879,390	1,703,416	7,235,652
Do. 1902	822,827	1,354,615	2,177,442	1,871,038	7,947,663
Do. 1903	983,687	1,452,624	2,436,311	2,064,801	8,770,720
From 1886 to 31st December, 1903	7,952,764	4,458,010	12,410,774	10,933,141	46,441,033

Digitized by Google

Month of January, 1904	92,394	118,979	211,373	176,653	750,374
Do. February, 1904	83,446	110,875	194,321	162,402	689,840
Do. March, 1904	52,878	110,851	163,729	136,835	581,238
Quarter ended 31st March, 1904	228,718	340,705	569,423	475,890	2,021,452
Month of April, 1904	105,769	110,804	216,573	180,999	768,834
Month of May, 1904	70,214	121,568	191,782	160,280	680,826
Five months ended 31st May, 1904	404,701	573,077	977,778	817,169	3,471,112
From 1886 to 31st May, 1904	8,357,465	5,031,087	13,388,552	11,750,310	49,912,145

Digitized by Google

No. 30.—*Principal Crown Lands Transactions.*

(Compiled from Returns supplied by R. C. Clifton, Under Secretary for Lands.)

Area of Crown Lands for which Applications have been approved by the Lands Department.

Period.	Conditional Alienation.						Leases and Licenses.					
	Conditional Purchases.	Free Homestead Farms.	Grazing Leases.	Selections under Land Purchase Act.	Poison Land Leases.	Total.	Pastoral Leases.	Pastoral Licenses.	Special Leases.	Timber Leases.	Miscellaneous Leases.	Total.
	acres.	acre .	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.
Year 1900	157,198	50,855	72,649	6,745	...	287,447	8,163,224	...	440	31,360	7,714	8,202,738
Year 1901	210,259	64,204	63,020	4,061	11,180	352,724	17,647,035	4,200	253	82,750	1,402	17,735,640
Year 1902	260,186	95,917	215,598	11,540	10,165	593,406	22,095,047	33,409	186	42,880	20	22,171,542
Year 1903	564,982	277,727	306,941	6,862	11,371	1,167,883	32,502,585	3,473	227	14,080	...	32,520,365
January, 1904 ...	56,440	12,806	22,798	374	...	92,418	1,460,421	...	6	...	...	1,460,427
February, 1904 ...	68,699	21,821	49,717	...	...	140,237	1,324,740	...	6	...	...	1,324,746
March, 1904	63,687	14,309	69,520	2,774	850	151,140	12,963,835	...	28	...	...	12,963,863
April, 1904	27,923	12,497	14,139	2,754	...	57,313	1,265,700	...	...	...	...	1,265,700
May, 1904	52,902	21,508	35,867	1,955	...	112,232	1,925,351	...	80	...	...	1,925,431
Five months ended 31st May, 1904 ...	269,651	82,941	192,041	7,857	850	553,340	18,940,047	...	120	...	...	18,940,167

Digitized by Google

IX.—AGRICULTURE.

No. 31.—*Areas under various kinds of Crops in Western Australia during each of the Eight Seasons 1896-97 to 1903-1904.*

Season ended last day of	Grain Crops.					Hay of all kinds.	Potatoes.	Root Crops.		Other Crops.	Fruit.		Total Area under Crop.
	Wheat.	Maize.	Oats.	Barley.	All other Grain Crops.			Onions.	All other Root Crops.		Vines.	Orchards.	
	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.
February, 1897	31,489	30	1,753	1,903	340	69,437	720	59	134	1,186	2,294	2,303	111,788
Do. 1898	38,706	243	1,678	1,694	428	80,939	1,361	54	133	2,370	2,654	2,923	133,183
Do. 1899	75,032	110	3,072	2,186	700	79,223	1,675	96	128	2,916	2,861	3,678	171,777
Do. 1900	84,462	133	3,940	3,885	921	78,893	2,837	137	157	3,292	3,245	4,465	186,867
Do. 1901	74,308	91	4,790	2,536	844	104,254	1,794	73	172	3,865	3,825	5,286	201,338
Do. 1902	94,709	512	9,751	2,669	719	92,654	1,829	164	129	4,690	3,629	6,476	217,441
Do. 1903	92,398	109	10,334	3,783	868	105,791	2,084	88	130	4,817	3,528	6,872	229,902
Do. 1904*	**129,297**	**162**	**14,561**	**3,549**	**987**	**116,359**	**1,797**	**90**	**145**	**3,587**	**3,262**	**7,956**	**291,874**

* All figures in black type are preliminary figures, liable to revision.

Digitized by Google

No. 32.—*Total Yield of the Principal Crops and quantity of Wine made in Western Australia for each of the Eight Seasons 1896-97 to 1903-1904.*

Season ended last day of	Grain Crops.							Hay of all kinds.	Potatoes.	Root Crops.		Wine.
	Wheat.	Maize.	Oats.	Barley.	Rye.	Dry Beans.	Dry Peas.			Onions.	All other Root Crops.	
	bushels.	bushels.	bushels.	bushels.	bushels.	bushels.	bushels.	tons.	tons.	tons.	tons.	gallons.
February, 1897	243,928	504	18,871	12,816	*	*	*	50,500	2,089	144	228	75,693
Do. 1898	408,595	4,826	29,266	23,423	2,917	734	1,082	75,464	4,270	152	371	89,099
Do. 1899	870,909	1,365	55,854	29,295	4,812	491	2,421	77,297	5,698	245	457	113,799
Do. 1900	966,601	2,263	73,556	56,587	4,748	211	4,531	70,078	8,373	349	1,000	86,802
Do. 1901	774,653	1,399	86,433	29,188	3,979	94	3.585	103,813	4,836	190	737	130,377
Do. 1902	956,886	5,203	163,654	34,723	2,933	128	3,777	89,729	5,739	377	390	185,735
Do. 1903	985,559	2,110	167,882	46,255	4,419	382	5,175	94,007	6,488	237	674	158,853
Do. 1904†	**1,855,460**	**2,474**	**255,300**	**51,487**	‡	‡	‡	**119,156**	**4,315**	**328**	**707**	‡

* No information available.

† All figures in black type are preliminary figures, liable to revision.
‡ Information not yet available.

Digitized by Google

No. 33.—*Average Yield per Acre of the Principal Crops in Western Australia for each of the Eight Seasons 1896-97 to 1903-1904.*

Season ended last day of	Grain Crops.							Hay of all kinds.	Potatoes.	Root Crops.	
	Wheat.	Maize.	Oats.	Barley.	Rye.	Dry Beans.	Dry Peas.			Onions.	All other Root Crops.
	bush. per acre.	bush. per acre.	bush. per acre.	bush. per acre.	bush. per acre.	bush. per acre.	bush. per acre.	tons per acre.	tons per acre.	tons per acre.	tons per acre.
February 1897 ...	7·75	16·66	10·76	6·73	*	*	*	0·73	2·90	2·42	1·71
Do. 1898 ...	10·56	19·84	17·44	13·83	8·51	42·86	15·88	0·93	3·14	2·80	2·78
Do. 1899 ...	11·61	12·38	18·18	13·40	9·36	27·28	14·43	0·98	3·40	2·56	3·57
Do. 1900 ...	11·44	17·02	18·67	14·57	8·74	13·69	12·48	0·89	2·95	2·55	6·37
Do. 1901 ...	10·42	15·37	18·04	11·51	8·34	9·89	10·01	1·00	2·70	2·60	4·28
Do. 1902 ...	10·10	10·16	16·78	13·01	7·94	6·73	11·44	0·97	3·14	2·30	3·02
Do. 1903 ...	10·67	19·36	16·25	12·23	9·54	14·69	13·65	0·89	3·11	2·69	5·18
Do. 1904† ...	**13·32**	**15·27**	**17·60**	**14·54**	‡	‡	‡	**1·02**	**2·40**	**3·64**	**4·38**

* No information available.

† All figures in black type are preliminary figures, liable to revision.
‡ Information not yet available.

Digitized by Google

X.—INDUSTRIAL ESTABLISHMENTS.

(EXCLUSIVE OF MINES.)

No. 34.—*Output of the principal Manufacturing Establishments of Western Australia during the Years 1897 to 1903.*

Factories, etc.	Articles, etc., Produced or Treated.		1897.	1898.	1899.	1900.	1901.	1902.	† 1903.
Tanneries	Hides tanned	number	13,020	11,620	10,200	11,195	12,852	10,730	**16,260**
	Skins tanned	number	*	7,000	6,632	9,810	11,450	6,100	**38,800**
Lime Works ...	Lime burned...	bags	*	*	*	*	*	*	**219,879**
Flour Mills ...	Wheat ground	bushels	365,942	438,265	490,035	626,042	493,263	576,781	**685,652**
	Flour made ...	tons	7,314	8,460	10,042	12,539	10,278	11,840	**13,711**
Aerated Water and Cordial Factories	Aerated Waters made	dozens	1,061,178	890,135	1,085,922	1,201,029	1,084,852	1,229,786	**1,211,700**
	Cordials made	dozens	19,499	15,892	16,163	29,875	17,307	16,027	**13,636**
Breweries ...	Beer and Stout made	gallons	2,817,982	3,278,008	3,373,642	4,015,490	4,225,037	4,780,058	**4,932,650**
Boot Factories ...	Boots and Shoes made	pairs	171,307	207,957	217,416	249,786	264,768	212,768	**220,525**
Brickworks ...	Bricks made ...	number	36,564,400	26,810,900	18,564,710	25,234,084	30,160,162	37,721,897	**45,576,179**
Forest Saw Mills ...	Timber sawn	super. feet	85,052,976	103,042,991	118,051,861	112,693,000	122,413,865	124,005,005	**119,465,433**
Gas Works	Gas supplied...	cubic feet	52,810,290	56,988,680	48,806,400	59,977,130	52,203,900	52,423,870	**54,434,300**
Soap and Candle Works	Soap made ...	cwt.	19,175	20,381	21,460	24,520	20,315	22,782	**27,232**
	Candles made	lbs.	765,135	1,169,475	1,881,600	1,828,499	1,737,292	1,866,725	**1,789,106**
Tobacco and Cigar Factories	Tobacco made	lbs.	83,600	67,477	78,155	100,448	115,855	94,393	‡
	Cigars made ...	number	840,400	583,275	694,650	1,045,900	1,140,611	1,054,975	‡
		lbs.	7,826	6,985	8,712	13,063	14,263	13,832	‡
	Cigarettes made	number	2,909,000	585,000	1,056,000	1,588,000	4,206,000	2,804,000	‡
		lbs.	6,545	1,316	2,640	4,367	10,500	6,758	‡

* No information available. † All figures in black type are preliminary figures liable to revision. ‡ Complete information not yet available.

Digitized by Google

No. 35.—*Number of Industrial Establishments (exclusive of Mines) in Western Australia from which Returns were received under the provisions of the Industrial Statistics Act, and the number of Males and Females employed in such Establishments for each of the Two years 1902 and 1903.**

NOTE.—The Industrial Establishments here dealt with are those which, excluding mines, come under the definition given in the Industrial Statistics Act, each being a "factory, workshop, or mill, where either four persons or more have been employed at any one time during the year, or where an engine driven by steam, gas, oil, or electricity has been used, whatever be the number of persons employed."

Nature of Industry.	1902.				1903.			
	No. of Establishments	Average number employed.			No. of Establishments	Average number employed.		
		Males	Females.	Total.		Males	Females	Total.
Class I.—Treating Raw Material, the product of Pastoral Pursuits, or Vegetable Products not otherwise specified.								
A.—ANIMAL PRODUCTS.								
Bone Mills	2	7	..	7	2	9	..	9
Tanneries	3	43	..	43	2	61	..	61
Fellmongeries	..	..	..	..	1			
Total Class I., A.	5	50	..	50	5	70	..	70
B.—VEGETABLE PRODUCTS.								
Chaff-cutting Works	2	12	..	12	3	28	..	28
Chaff-grading Mill	1	13	..	13	3	15	..	15
Corn-crushing Works	2							
Total Class I., B.	5	25	..	25	6	43	..	43

* The figures for 1903 are preliminary figures, liable to revision.

Digitized by Google

No. 35.—*Industrial Establishments (exclusive of Mines), 1902 and 1903*—continued.

Nature of Industry.	1902.				1903.			
	No. of Establishments.	Average number employed.			No. of Establishments.	Average number employed.		
		Males.	Females.	Total.		Males.	Females.	Total.
Class II.—Oil and Fats, Animal and Vegetable.								
Soap and Candle Works	4	75	..	75	5	67	..	67
Total Class II.	4	75	..	75	5	67	..	67
Class III.—Processes relating to Stone, Clay, Glass, etc.								
Brick Works	31	484	1	485	37	549	1	550
Glazing Establishments	3	40	3	43	2	31	..	31
Lime Works	4	100	..	100	8	117	..	117
Modelling Works	2	10	..	10	2	12	..	12
Total Class III.	40	634	4	638	49	709	1	710
Class IV.—Working in Wood.								
Box and Packing-case Works	..	..	..	..	2	19	..	19
Sawmills (Forest)	27	2,972	6	2,978	30	2,776	1	2,777
Sawmills (Town) and Joinery Works	29	} 648	1	649	{ 27	} 786	2	788
Cooperage Works	1				1			
Total Class IV.	57	3,620	7	3,627	60	3,581	3	3,584
Class V.—Metal Works, Machinery, etc.								
Agricultural Implement Works	4	40	..	40	4	45	1	46
Engineering Works, Iron Works, Foundries, Plumbing and Tinsmithing Establishments	44	} 1,042	5	1,047	{ 43	977	2	979
Wire Working Establishment	1				2	14	..	14
Railway and Tramway Workshops	4	1,093	2	1,095	4	1,059	9	1,068
Total Class V.	53	2,175	7	2,182	53	2,095	12	2,107

Digitized by Google

Class VI.—Connected with Food and Drink, or the preparation thereof.								
B.—Vegetable Food.								
Biscuit Factory	1	92	56	148	1	100	63	163
Confectionery Works	5				4			
Flour Mills	16	94	..	94	14	101	..	101
Jam, Pickle, Sauce, and Vinegar Works	3	39	15	54	4	38	20	58
Total Class VI., B.	25	225	71	296	23	239	83	322
C.—Drinks and Stimulants.								
Aerated Water and Cordial Factories	62	328	3	331	61	346	5	351
Breweries	34	440	..	440	35	459	1	460
Malt	..	..	..	..	1			
Condiments, Coffee, etc.	2	22	..	22	2	21	..	21
Ice and Refrigerating Works	5	65	1	66	6	74	1	75
Water Condensing Works	21	114	..	114	..	..	..	..
Total Class VI., C.	124	969	4	973	105	900	7	907
D.—Narcotics.								
Tobacco, Cigar, and Cigarette Works	4	67	38	105	4	67	39	106
Total Class VI., D.	4	67	38	105	4	67	39	106
Class VII.—Clothing and Textile Fabrics and Fibrous Material.								
A.—Dress.								
Boot and Shoe Factories	15	231	53	284	16	241	61	302
Dressmaking and Millinery Establishments	42	..	458	458	39	..	472	472
Tailoring Establishments	63	379	512	891	56	350	498	848
Shirtmaking and Underclothing Establishments ..	..	..	..	..	2	..	49	49
Total Class VII., A.	120	610	1,023	1,633	113	591	1,080	1,671

Digitized by Google

No. 35.—*Industrial Establishments (exclusive of Mines), 1902 and 1903*—continued.

Nature of Industry.	1902.				1903.			
	No. of Establishments.	Average number employed.			No. of Establishments.	Average number employed.		
		Males.	Females.	Total.		Males.	Females.	Total.
Class VII.—Clothing and Textile Fabrics and Fibrous Materials—continued.								
B.—FIBROUS MATERIALS AND TEXTILES NOT ELSEWHERE INCLUDED.								
Tent-making Establishments	3	10	4	14	3	13	4	17
Total Class VII., B.	3	10	4	14	3	13	4	17
Class VIII.—Books, Paper, Printing, Engraving.								
Cardboard and Paper Box-making Establishments ..	2	5	23	28	2	2	23	26
Photographic Establishments	3	17	11	28	4	24	18	42
Engraving Establishment	..	..	..	..	1			
Printing and Bookbinding Works	39	782	72	854	40	815	79	894
Total Class VIII.	44	804	106	910	47	842	120	962
Class XI.—Vehicles and Fittings, Saddlery, Harness, etc.								
Coach and Wagon Building and Blacksmithing Establishments	41	372	1	373	42	345	..	345
Cycle Works	5	41	..	41	6	45	1	46
Saddlery and Harness-making Establishments ..	9	121	3	124	8	117	1	118
Total Class XI.	55	534	4	538	56	507	2	509

Digitized by Google

Class XII.—Shipbuilding, Fittings, etc.								
Dock and Slip Works	1	76	..	76	1	92	..	92
Boatbuilding Works, etc.	6				7			
Total Class XII.	7	76	..	76	8	92	..	92
Class XIII.—Furniture, Bedding, etc.								
Flock-making Establishment	1	276	6	282	..	..	..	..
Furniture and Cabinet-making Establishments ..	18				19	274	9	283
Picture Frame-making Establishment	1				2	17	2	19
Total Class XIII.	20	276	6	282	21	291	11	302
Class XIV.—Drugs, Chemicals, and By-Products.								
Chemical Works	3	14	17	31	3	13	17	30
Artificial Manure Works	1	23	3	26	1	24	3	27
Baking Powder Factory	1				1			
Eucalyptus Oil Works	1				1			
Paint Works	1				1			
Total Class XIV.	7	37	20	57	7	37	20	57
Classes XV. and XVI.—Surgical and Scientific Appliances and Timepieces, Jewellery and Plated Ware.								
Optician's Establishment	1	47	..	47	1	41	..	41
Manufacturing Jewellers' Establishments	4				4			
Total Classes XV. and XVI.	5	47	..	47	5	41	..	41
Class XVII.—Heat, Light, and Energy.								
Electrical Engineering Works	1	214	2	216	1	218	1	219
Electric Light and Power Works	11				11			
Gas Works	3	82	..	82	2	94	..	94
Fire Briquette Works	1				1			
Total Class XVII.	16	296	2	298	15	312	1	313

Digitized by Google

No. 35.—*Industrial Establishments (exclusive of Mines), 1902 and 1903*—continued.

Nature of Industry.	1902.				1903.			
	No. of Establishments.	Average number employed.			No. of Establishments.	Average number employed.		
		Males	Females.	Total.		Males.	Females.	Totals.
Class XIX.— Miscellaneous.*								
Butter Factory	1	19	5	24	1	35	7	42
Brushware Establishment	1				2			
Wickerware Establishment	1				1			
Leather Goods Manufacturing Establishments ..	2	9	3	12	1			
Total Class XIX.	5	28	8	36	5	35	7	42
Class XX.—† Supplementary.								
Bakeries	54	340	10	350	52	335	12	347
Firewood Yards	33	139	..	139	42	137	..	137
Quarries	8	78	..	78	7	68	1	69
Wine-making Establishments	5	27	..	27	4	21	..	21
Guano Works	1	64	..	64	1	81	..	81
Monumental Works	2				2			
Total Class XX.	103	648	10	658	108	642	13	655
GRAND TOTAL	702	11,206	1,314	12,520	698	11,174	1,403	12,577

*Owing to the necessity of concealing the contents of individual schedules, in compliance with Section 18 of "The Industrial Statistics Act, 1897," certain single industries have been transferred to the Miscellaneous Class. Those so transferred are:—Butter Factory, which belongs to VI., 1.—Animal Food; Leather Goods Manufacturing Establishments, which belong to XVIII., Leatherware.

† The Establishments contained in this Class are those which come under the definition of Industrial Establishments, according to "The Industrial Statistics Act, 1897," but which were excluded from the scheme of classification given in the foregoing 19 classes and adopted by the 1902 Conference of Statisticians held at Hobart.

Digitized by Google

XI.—METEOROLOGICAL STATISTICS.

(Compiled from returns supplied by W. E. Cooke, Government Astronomer.)

No. 36.—*Abstract of Meteorological Observations taken at Perth Observatory.*

Latitude, 31° 57′ S. Altitude above mean sea level, 197 feet. Longitude, 115° 51′ E.

Period.	Barometer corrected to 32° Fahrenheit and Mean Sea Level.				Thermometers in the Shade.									
	Average for previous six years.	Year 1903.			Average for previous 6 years.	Year 1903.					Highest recorded since 1st January, 1897.		Lowest recorded since 1st January, 1897.	
	Mean.	Mean.	Highest.	Lowest.	Mean.	Mean.	Mean maximum.	Mean minimum.	Max.	Min.	Max.	Date.	Min.	Date.
January ..	29.94	30.00	30.33	29.78	73	75	86	63	106	53	107	16–1–97	51	25–1–01
February ..	.95	.00	.29	.74	74	75	86	64	104	55	107	6–2–98	48	1–2–02
March	30.02	.04	.32	.80	71	67	77	57	98	46	104	10–3–02	46	25–3–99
April	.10	.06	.48	.72	66	63	71	55	86	44	97	10–4–99	42	2–4–01
May	.14	.16	.44	.84	61	62	70	54	80	44	82	9–5–99	40	†17–5–99
June	.07	.11	.54	.51	56	58	65	50	70	42	73	16–6–99	37	14–6–98
July	.15	.16	.54	.73	55	55	62	48	67	41	74	24–7–99	38	6–7–99
August	.13	.09	.37	.62	56	55	63	48	78	40	80	30–8–02	38	11–8–97
September ..	.12	.01	.45	.57	58	57	64	50	76	41	86	28–9–00	39	18–9–00
October	.05	.00	.25	.57	61	61	68	53	90	41	90	25–10–03	41	10–10–03
November ..	.04	29.97	.20	.73	66	67	76	57	97	51	101	27–11–01	46	12–11–97
December ..	29.98	.91	.08	.56	70	71	81	61	95	49	103	13–12–99	49	1–12–97
Year ended 31st December, 1903	30.06	30.04	30.54	29.51	64	64	72	55	106	40	107	*16–1–97	37	14–6–98

* Also on 6-2-98. † Also on 18-5.99.

Digitized by Google

No. 36.—*Abstract of Meteorological Observations taken at Perth Observatory*—continued.

Period.	Mean humidity. Year 1903.	Rain. Average for previous 27 years. Rain (100=1in.)	Rain. Average for previous 27 years. No. of wet days.	Rain. Year 1903. Rain (100=1in.)	Rain. Year 1903. No. of wet days.
January	52	35	2	2	1
February	55	38	2	*Nil*	*Nil*
March	58	81	4	20	5
April	67	170	7	216	15
May	67	490	13	98	13
June	76	656	16	623	19
July	74	610	16	496	18
August	73	560	17	925	17
September	72	303	14	772	20
October	66	203	11	224	18
November	58	80	5	130	7
December	58	64	4	63	7
Year ended 31st Dec., 1903	65	3,290	111	3,569	140

No. 37.—*Average Rainfall in Land Divisions to end of 1903.*

Land Divisions.	Rain (100=1in.) Range.	Rain (100=1in.) Average.	Periods of observations. Range.	Periods of observations. Average.
			years.	years.
Kimberley Land Division ..	3371 to 1825	2404	5 to 18	11
North-West do. do. ..	1936 to 789	1282	5 to 22	12
Gascoyne do. do. ..	1182 to 639	807	5 to 21	11
Eastern do. do. ..	1305 to 809	941	5 to 17	8
South-Western do. do. ..	3910 to 1034	2216	5 to 28	18
Eucla do. do. ..	2300 to 987	1404	12 to 20	14

Digitized by Google

XII.—GENERAL ELECTIONS.

(Compiled from figures supplied by R. P. G. Daly, Inspector of Parliamentary Rolls.)

No. 38.—*Return of the number of Persons in each Electoral District on the Roll of the Legislative Assembly in May, 1903.*

Electoral District.	No. on the Roll.			Electoral District.	No. on the Roll.		
	Males.	Females.	Total.		Males.	Females.	Total.
Albany	975	573	1,548	Mount Magnet	1,024	227	1,251
Beverley	533	128	661	Mount Margaret	3,279	269	3,548
Boulder	2,302	593	2,895	Murchison	374	153	527
Bunbury	1,185	646	1,831	Murchison, North	901	73	974
Claremont	2,353	1,317	3,670	Murray	1,693	566	2,259
Cockburn Sound	918	336	1,254	Nelson	415	108	523
Coolgardie	2,561	842	3,403	Northam	1,480	642	2,122
Cue	1,194	208	1,402	Perth	2,122	415	2,537
Dundas	1,270	325	1,595	Perth, East	1,582	643	2,225
Fremantle	826	127	953	Perth, North	4,274	1,522	5,796
Fremantle, East	1,810	825	2,635	Perth, South	2,824	902	3,726
Fremantle, North	1,324	664	1,988	Perth, West	3,123	1,730	4,853
Fremantle, South	2,002	860	2,862	Pilbara	812	21	833
Gascoyne	381	74	455	Plantagenet	1,009	296	1,305
Geraldton	640	327	967	Roebourne	221	59	280
Greenough	357	170	527	South-West Mining	1,525	417	1,942
Guildford	1,613	423	2,036	Subiaco...	2,914	1,329	4,243
Hannans	6,745	1,005	7,750	Sussex	580	282	862
Irwin	186	64	250	Swan	1,133	239	1,372
Kalgoorlie	3,505	1,357	4,862	Toodyay	552	251	803
Kanowna	3,591	607	4,198	Wellington	1,330	403	1,733
Kimberley, East	225	26	251	Williams	792	282	1,074
Kimberley, West	341	30	371	Yilgarn	771	194	965
Menzies	2,357	305	2,662	York	769	375	1,144
Moore	494	211	705				
Mount Burges	2,519	509	3,028	Total number on the Roll	77,706	23,950	101,656

Digitized by Google

No. 39.—*Return of the Number of Persons in each Electoral Province and District on the Roll of the Legislative Council in May, 1903.*

Electoral Province and District.	No. on the Roll.		
	Males.	Females.	Total.
Central Province—			
Cue	280	22	302
Geraldton	269	50	319
Greenough	110	11	121
Irwin	47	4	51
Mount Magnet	195	17	212
Murchison	163	11	174
North Murchison	139	3	142
Total Central Province	1,203	118	1,321
East Province—			
Beverley	287	5	292
Moore	141	3	144
Northam	492	79	571
Swan	413	20	433
Toodyay	377	22	399
York	311	46	357
Total East Province	2,021	175	2,196
Metropolitan Province—			
Perth	999	165	1,164
East Perth	621	164	785
North Perth	1,231	231	1,462
West Perth	1,138	289	1,427
Total Metropolitan Province	3,989	849	4,838
Metropolitan-Suburban Province—			
Claremont	778	186	964
Guildford	603	81	684
South Perth	691	99	790
Subiaco	804	147	951
Total Metropolitan-Suburban Province	2,876	513	3,389
North Province—			
Gascoyne	102	7	109
East Kimberley	47	1	48
West Kimberley	53	..	53
Pilbara	57	..	57
Roebourne	90	6	96
Total North Province	349	14	363

Digitized by Google

No. 39.—*Return of the Number of Persons in each Electoral Province and District on the Roll of the Legislative Council in May, 1903*—continued.

Electoral Province and District.	No. on the Roll.		
	Males.	Females.	Total.
NORTH-EAST PROVINCE—			
Boulder	893	96	989
Hannans	406	13	419
Kalgoorlie	1,000	139	1,139
Kanowna	389	52	441
Mount Margaret	309	33	342
Menzies	314	39	353
Total North-East Province	3,311	372	3,683
SOUTH PROVINCE—			
Mount Burges	80	5	85
Coolgardie	362	79	441
Dundas	153	21	174
Yilgarn	91	15	106
Total South Province	686	120	806
SOUTH-EAST PROVINCE—			
Albany	390	67	457
Plantagenet	344	18	362
Williams	402	20	422
Total South-East Province	1,136	105	1,241
SOUTH-WEST PROVINCE—			
Bunbury	409	68	477
Murray	189	17	206
Nelson	189	18	207
South-West Mining	377	44	421
Sussex	147	39	186
Wellington	192	11	203
Total South-West Province	1,503	197	1,700
WEST PROVINCE—			
Cockburn Sound	513	61	574
Fremantle	395	44	439
Fremantle, East	689	209	898
Fremantle, North	384	85	469
Fremantle, South	831	161	992
Total West Province	2,812	560	3,372
TOTAL NUMBER ON THE ROLL	19,886	3,023	22,909

Digitized by Google

XIII.—CENSUS RETURNS.

No. 40.—*Return showing a comparison between the Population enumerated in State Electoral Districts at the Census taken on 31st March, 1901, and at the rough Census taken in March and April, 1903.*

Electoral District.	Census, 31-3-1901.				Rough Census. March-April, 1903.				Increase.			
	Males.	Females.	Total.	Females to 100 Males.	Males.	Females.	Total.	Females to 100 Males.	Males.	Females.	Total.	Total Increase per cent.
Districts enumerated in 1901 *and* 1903.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	%
Albany †	1,782	1,812	3,594	101.68	1,708	1,727	3,435	101.11	*74	*85	*159	*4.4
Beverley	1,043	708	1,751	67.88	1,366	823	2,189	60.25	323	115	438	25.0
Boulder	2,720	1,881	4,601	69.15	3,090	2,568	5,658	83.11	370	687	1,057	23.0
Bunbury †	1,735	1,658	3,393	95.56	1,874	1,740	3,614	92.85	139	82	221	6.5
Claremont	2,815	2,461	5,276	87.42	3,426	3,449	6,875	100.67	611	988	1,599	30.3
Cockburn Sound	1,478	1,070	2,548	72.40	1,736	1,331	3,067	76.67	258	261	519	20.4
Coolgardie	2,404	1,845	4,249	76.75	2,124	1,706	3,830	80.32	*280	*139	*419	*9.9
Cue	1,709	670	2,379	39.20	2,340	1,091	3,431	46.62	631	421	1,052	44.2
Dundas	1,858	766	2,624	41.23	1,467	717	2,184	48.88	*391	*49	*440	*16.8
Fremantle †	1,435	682	2,117	47.53	1,063	599	1,662	56.35	*372	*83	*455	*21.5
Fremantle, East	3,611	2,920	6,531	80.86	4,242	3,559	7,801	83.90	631	639	1,270	19.4
Fremantle, North	1,795	1,451	3,246	80.84	1,879	1,699	3,578	90.42	84	248	332	10.2
Fremantle, South	3,991	3,368	7,359	84.39	4,659	3,846	8,505	82.55	668	478	1,146	15.6
Geraldton †	1,372	1,204	2,576	87.76	1,395	1,187	2,582	85.09	23	*17	6	0.2
Greenough	884	659	1,543	74.55	995	704	1,699	70.75	111	45	156	10.1
Guildford	2,365	1,912	4,277	80.85	3,185	2,574	5,759	80.82	820	662	1,482	34.7
Hannans	9,881	4,967	14,848	50.27	9,527	6,231	15,758	65.40	*354	1,264	910	6.1
Irwin	618	423	1,041	68.45	681	482	1,163	70.78	63	59	122	11.7
Kalgoorlie	4,038	2,614	6,652	64.74	3,904	2,876	6,780	73.67	*134	262	128	1.9
Kanowna	3,016	1,287	4,303	42.67	3,661	1,462	5,123	39.93	645	175	820	19.1
Menzies	3,572	1,138	4,710	31.86	4,003	1,646	5,649	41.12	431	508	939	19.9
Moore	1,034	719	1,753	69.54	1,156	758	1,914	65.57	122	39	161	9.2
Mount Burges	3,137	929	4,066	29.61	2,705	1,045	3,750	38.63	*432	116	*316	*7.8
Mount Magnet	1,607	583	2,190	36.28	1,179	615	1,794	52.16	*428	32	*396	*18.1
Mount Margaret	4,932	947	5,879	19.20	6,065	1,596	7,661	26.31	1,133	649	1,782	30.3
Murchison	666	431	1,097	64.71	639	424	1,063	66.35	*27	*7	*34	*3.1
Murchison, North	1,094	202	1,296	18.46	1,279	274	1,553	21.42	185	72	257	19.8
Murray	2,399	1,480	3,879	61.69	2,443	1,552	3,995	63.53	44	72	116	3.0
Nelson	735	553	1,288	75.24	928	679	1,607	73.17	193	126	319	24.8

Digitized by Google

Northam	2,595	1,852	4,447	71.37	2,844	2,051	4,895	72.12	249	199	448	10.1
Perth †	2,905	1,650	4,555	56.80	2,937	1,602	4,539	54.55	32	*48	*16	*0.4
Perth, East	2,604	2,682	5,286	103.00	2,940	2,911	5,851	99.01	336	229	565	10.7
Perth, North	5,157	5,054	10,211	97.00	6,878	6,681	13,559	97.14	1,721	1,627	3,348	32.8
Perth, South	1,571	1,359	2,930	86.51	2,073	1,668	3,741	80.46	502	309	811	27.7
Perth, West	4,723	4,203	8,926	88.99	5,429	4,798	10,227	88.38	706	595	1,301	14.6
Plantagenet	1,537	985	2,522	64.09	1,687	1,047	2,734	62.06	150	62	212	8.4
South-West Mining	1,743	1,075	2,818	61.68	2,348	1,463	3,811	62.31	605	388	993	35.2
Subiaco	2,938	2,708	5,646	92.17	4,633	4,507	9,140	97.28	1,695	1,799	3,494	61.9
Sussex †	1,132	816	1,948	72.08	1,295	976	2,271	75.37	163	160	323	16.6
Swan	2,386	1,357	3,743	56.87	2,149	1,386	3,535	64.50	*237	29	*208	*5.6
Toodyay	1,164	847	2,011	72.77	1,315	924	2,239	70.27	151	77	228	11.3
Wellington	1,841	1,203	3,044	65.34	2,369	1,430	3,799	60.36	528	227	755	24.8
Williams	1,631	1,123	2,754	68.85	2,614	1,556	4,170	59.53	983	433	1,416	51.4
Yilgarn	961	585	1,546	60.87	1,007	646	1,653	64.15	46	61	107	6.0
York	1,318	1,124	2,442	85.28	1,433	1,132	2,565	79.00	115	8	123	5.0
Total	105,932	69,963	175,895	66.05	118,670	83,738	202,408	70.56	12,738	13,775	26,513	15.1
Districts enumerated in 1901, but not in 1903.												
Gascoyne	922	288	1,210	31.24	..	..	..	..	..	..	..	..
Kimberley, East	205	35	240	17.07	..	..	..	..	..	..	..	..
Kimberley, West	1,805	175	1,980	9.70	..	..	..	..	..	..	..	..
Pilbara	1,193	126	1,319	10.56	..	..	..	..	..	..	..	..
Roebourne	589	175	764	29.71	..	..	..	..	..	..	..	..
Population living on board ships in Albany, Bunbury, Fremantle, Geraldton, Perth, and Sussex Electoral Districts	2,229	487	2,716	..	..	..	..	..	..	..	..	..
Total Population enumerated at the Census, 31st March, 1901 ..	112,875	71,249	184,124	63.12	..	..	..	..	..	..	..	..

* Decrease. † Exclusive of Population enumerated on Board Ships.

Digitized by Google

No. 41.—*Return showing a comparison between the Population enumerated in certain Municipalities at the Census taken on the 31st March, 1901, and at the rough Census taken in March and April, 1903.*

Municipality.	Census, 31-3-1901.				Rough Census. March-April, 1903.				Increase.			
	Males.	Females.	Total.	Females to 100 Males.	Males.	Females.	Total.	Females to 100 Males.	Males.	Females.	Total.	Total increase per cent.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	%
Albany	1,782	1,812	3,594	101.68	1,708	1,727	3,435	101.11	*74	*85	*159	*4.4
Beverley	112	82	194	73.21	131	106	237	80.91	19	24	43	22.2
Boulder	2,720	1,881	4,601	69.15	3,090	2,568	5,658	83.11	370	687	1,057	23.0
Broad Arrow	343	199	542	58.02	411	232	643	56.45	68	33	101	18.6
Bulong	110	81	191	73.64	156	115	271	73.72	46	34	80	41.9
Bunbury	1,229	1,226	2,455	99.76	1,343	1,334	2,677	99.33	114	108	222	9.0
Busselton	218	234	452	107.34	210	232	442	110.48	*8	*2	*10	*2.2
Claremont	1,037	977	2,014	94.21	1,325	1,402	2,727	105.81	288	425	713	35.4
Coolgardie	2,404	1,845	4,249	76.75	2,124	1,706	3,830	80.32	*280	*139	*419	*9.9
Cue	755	436	1,191	57.75	457	313	770	68.49	*298	*123	*421	*35.3
Day Dawn	260	93	353	35.77	372	251	623	67.47	112	158	270	76.5
Esperance	174	167	341	95.98	159	147	306	92.45	*15	*20	*35	*10.3
Fremantle	8,353	6,351	14.704	76.03	9,155	7,212	16,367	78.78	802	861	1,663	11.3
Fremantle, East	1,323	1,171	2,494	88.51	1,569	1,494	3,063	95.22	246	323	569	22.8
Fremantle, North	1,795	1,451	3,246	80.84	1,879	1,699	3,578	90.42	84	248	332	10.2
Geraldton	1,285	1,173	2,458	91.28	1,339	1,165	2,504	87.01	54	*8	46	1.9
Gingin	96	61	157	63.54	104	64	168	61.54	8	3	11	7.0
Guildford	720	742	1,462	103.06	812	854	1,666	105.17	92	112	204	14.0
Kalgoorlie	4,038	2,614	6,652	64.74	3,904	2,876	6,780	73.67	*134	262	128	1.9
Kanowna	629	415	1,044	65.98	730	482	1,212	66.03	101	67	168	16.1
Leederville	1,331	1,214	2,545	91.21	1,872	1,837	3,709	98.13	541	623	1,164	45.7
Leonora	225	89	314	39.56	248	160	408	64.52	23	71	94	29.9
Malcolm	146	104	250	71.23	303	146	449	48.18	157	42	199	79.6
Menzies	1,050	437	1,487	41.62	610	436	1,046	71.48	*440	*1	*441	*29.7
Midland Junction	911	657	1,568	72.12	1,242	966	2,208	77.78	331	309	640	40.8
Mount Magnet	241	133	374	55.19	153	121	274	79.08	*88	*12	*100	*26.7
Mount Morgans	503	140	643	27.83	488	239	727	48.96	*15	99	84	13.1
Nannine	72	21	93	29.17	112	40	152	35.71	40	19	59	63.4
Newcastle	167	172	339	102.99	165	192	357	116.36	*2	20	18	5.3
Norseman	155	108	263	69.68	154	99	253	64.29	*1	*9	*10	*3.8
Northam	1,072	946	2,018	88.25	1,305	1,121	2,426	85.90	233	175	408	20.2

Digitized by Google

Perth	14,588	12,965	27,553	88.87	16,823	14,848	31,671	88.26	2,235	1,883	4,118	14.9
Southern Cross	351	213	564	60.68	328	244	572	74.39	*23	31	8	1.4
Subiaco	1,514	1,491	3,005	98.48	2,368	2,334	4,702	98.56	854	843	1,697	56.5
Victoria Park	674	593	1,267	87.98	723	677	1,400	93.64	49	84	133	10.5
York	673	689	1,362	102.38	654	685	1,339	104.74	*19	*4	*23	*1.7
Total	53,056	42,983	96,039	81.01	61,988	52,594	114,582	84.85	8,932	9,611	18,543	19·3
New Municipalities declared since 1901 Census.												
Collie	..	..	†	..	974	739	1,713	75.87	..	..	..	..
Kookynie	..	..	†	..	1,074	446	1,520	41.53	..	..	..	..
Paddington	..	..	†	..	138	80	218	57.97	..	..	..	..
Perth, North	..	..	†	..	797	737	1,534	92.47	..	..	..	..
Perth, South	..	..	†	..	479	468	947	97.70	..	..	..	..
Municipalities enumerated in 1901, but not in 1903.												
Carnarvon	186	104	290	55.91	..	..	‡	..	..	..	..	..
Cossack	127	39	166	30.71	..	..	‡	..	..	..	..	..
Roebourne	212	100	312	47.17	..	..	‡	..	..	..	..	..

* Decrease. † Declared a Municipality since the time of the taking of the Census in 1901. ‡ Municipalities not enumerated in 1903.

Digitized by Google

No. 42.—*Population of Perth and Suburbs, March and April, 1903.*

District.	Males.	Females.	Total.	Females to 100 Males.
Perth Municipality	16,823	14,848	31,671	88·26
Subiaco Municipality	2,368	2,334	4,702	98·56
Leederville Municipality	1,872	1,837	3,709	98·13
Victoria Park Municipality	723	677	1,400	93·64
South Perth Municipality	479	468	947	97·70
North Perth Municipality	797	737	1,534	92·47
Locality East of North Perth Municipality, including Maylands and Peninsula	233	177	410	75·97
Total, Perth and Suburbs ...	23,295	21,078	44,373	90·48

Increase since the census of 31st March, 1901, 8,099, equal to 22·33 per cent.

No. 43.—*Population of Fremantle and Suburbs, March and April, 1903.*

District.	Males.	Females.	Total.	Females to 100 Males.
Fremantle Municipality	9,155	7,212	16,367	78·78
East Fremantle Municipality	1,569	1,494	3,063	95·22
North Fremantle Municipality ...	1,879	1,699	3,578	90·42
Total, Fremantle and Suburbs	12,603	10,405	23,008	82·56

Increase since the census of 31st March, 1901, 2,564, equal to 12·54 per cent.

Digitized by Google

XIV.—MISCELLANEOUS.

No. 44.—*Breadstuffs Statistics, 1896-1903.*

Year.	Imports, Exports, and Production of Wheat.							
	Imports during the Year ended 31st December.				Exports during the year ended 31st December of Flour and Wheat.	Excess of Imports over Exports.	Quantity of Wheat produced in Western Australia during Season ended February.	Total Wheat available from Importation and Home production.
	Flour Imported.		Wheat Imported.	Total Imports of Flour and Wheat expressed in bushels of Wheat.				
	Quantity.	Equivalent in Wheat.*			Equivalent in bushels of Wheat.			
	Tons.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1896	14,889	744,450	181,846	926,296	*Nil*	926,296	188,077	1,114,373
1897	15,983	799,150	212,750	1,011,900	*Nil*	1,011,900	243,928	1,255,828
1898	14,866	743,300	291,571	1,034,871	*Nil*	1,034,871	408,595	1,443,466
1899	10,945	547,250	78,038	625,288	1,600	623,688	870,909	1,494,597
1900	9,994	499,700	76,985	576,685	3,449	573,236	966,600	1,539,836
1901 .. .	13,460	673,000	214,410	887,410	2,513	884,897	774,653	1,659,550
1902	14,377	718,850	86,088	804,938	600	804,338	956,886	1,761,224
1903 .. .	15,242	762,100	182,135	944,235	628	943,607	985,559	1,929,166

*One ton of flour estimated equivalent to 50 bushels of wheat.

Digitized by Google

No. 44.—*Breadstuffs Statistics, 1896-1903*—continued.

Year.	Quantities of Wheat required for Seed and available for Food.		Mean Population.	Wheat per Head of Mean Population.			
					Requirements, Production, and Deficiency.		
	Estimated Quantity of Seed required for the following Season.	Net Quantity of Wheat available for Food.		Quantity available for Food.	Gross requirements of Wheat for Seed and Food.	Home production of Wheat.	Deficiency.
	Bushels.	Bushels.	No.	Bushels per Head.	Bushels per Head.	Bushels per Head.	Bushels per Head.
1896	116,000	998,373	122,696	8.1	9.1	1.5	7.6
1897	137,333	1,118,495	155,563	7.2	8.1	1.6	6.5
1898	172,500	1,270,966	168,999	7.5	8.5	2.4	6.1
1899	173,565	1,321,032	168,528	7.8	8.9	5.2	3.7
1900	186,099	1,353,737	177,073	7.6	8.7	5.5	3.2
1901	199,223	1,460,327	188,603	7.7	8.8	4.1	4.7
1902	203,085	1,558,139	207,142	7.5	8.5	4.6	3.9
1903	250,000	1,679,166	223,641	7.5	8.6	4.4	4.2

Digitized by Google

On the assumption that the mean population for the year 1904 will be 236,000, and that the requirements of wheat for food per head of population will be 7·5 bushels, the total amount required for food during 1904 will be 1,770,000 bushels.

To this must be added the quantity of seed to be sown for grain and hay during the season, which, on the basis of the experience of recent years, may be roughly estimated at 260,000 bushels.

The total amount of wheat required by this State during 1904 will thus be 2,030,000 bushels. According to the preliminary wheat returns for the present season, it appears that the aggregate wheat yield for the whole State is approximately 1,900,000 bushels, thus leaving only 130,000 bushels of wheat, or its equivalent in flour, that it will be necessary to obtain from outside sources. This may be summarised as follows:—

ESTIMATES FOR 1904.

Mean population	236,000	
Consumption per head of wheat for food	7·5	bushels
Total food requirements	1,770,000	„
Seed requirements	260,000	„
Gross requirements for food and seed	2,030,000	„
Preliminary returns of wheat production for season ended February, 1904	1,900,000	„
Estimated requirements from outside sources	130,000	„

Digitized by Google

No. 45.—*Comparative Statement of Wheat Harvest in Western Australia, for the Seasons 1902-3 and 1903-4.*

Magisterial District.	Final Figures—Season 1902-3.			Preliminary Figures—Season 1903-4.		
	Area under Wheat for grain.	Total production.	Average production per acre.	Area under Wheat for grain.	Total production.	Average production per acre.
	Acres.	Bushels.	Bushels.	Acres.	Bushels.	Bushels.
Blackwood	380	4,539	11.94	403	3,434	8.52
Collie	6	60	10.00	..	..	..
Dundas and Esperance ..	8	100	12.50	..	..	..
Fremantle and Perth ..	51	690	13.53	25	375	15.00
Katanning, Plantagenet, and Williams	25,494	291,473	11.43	40,432	400,590	9.91
Murray	81	784	9.68	38	392	10.32
Northam, Swan, and Toodyay	30,954	269,371	8.70	45,103	678,298	15.04
Phillips River	30	150	5.00	20	120	6.00
Sussex	85	958	11.27	70	699	9.99
Victoria and Northampton	8,500	73,127	8.60	12,480	143,460	11.50
Wellington	488	5,552	11.38	515	5,898	11.45
Yilgarn	2	25	12.50	..	..	..
York	26,319	338,730	12.87	37,609	666,284	17.72
Total	92,398	985,559	10.67	136,695	1,899,550	13.90

Digitized by Google

B.—AUSTRALASIAN STATISTICS.

I.—POPULATION AND VITAL STATISTICS.

No. 1.—Estimated Population of Capitals, 31st December, 1901 and 1902.

Capital (including suburbs).	* Latitude S.	* Longitude E.	1901.				1902.			
			Males.	Females.	Total.	Females to 100 Males.	Males.	Females.	Total.	Females to 100 Males.
	° ′	° ′	No.	No.	No.	No.	No.	No.	No.	No.
Perth	31 57	115 50	20,230	18,170	38,400	87·83	22,114	20,364	42,478	92·09
Sydney	33 52	151 12	246,160	250,830	496,990	101·90	251,190	257,320	508,510	102·44
Melbourne	37 50	144 59	237,130	264,450	501,580	111·52	238,300	264,310	502,610	110·91
Brisbane	27 28	153 2	59,245	60,183	† ‡ 119,428	101·58	60,798	62,017	† 122,815	102·01
Adelaide	34 56	138 35	78,278	85,152	163,430	108·77	79,251	86,472	165,723	109·11
Hobart	42 53	147 20	16,422	18,260	34,682	111·19	16,483	18,326	34,809	111·18
Wellington	41 18	174 47	§	§	‡ 49,344	§	§	§	52,590	§

* Latitudes and Longitudes, except for Hobart, taken from Nautical Almanac for 1904. † Ten-mile radius. ‡ Population on 31st March, 1901.
§ Males and females not distinguished.

Digitized by Google

No. 2.—Estimated Population of each State of the Commonwealth of Australia and the Colony of New Zealand on 31st December, 1901 and 1902.

State or Colony.	Area in square miles.	Population on the 31st December.			Number of		Increase during year.			Increase per cent. during the year.		
		Males.	Females.	Total.	Females to 100 males.	Persons to the square mile.	Males.	Females.	Total.	Males.	Females.	Total.
1901.		No.	No.	No.			No.	No.	No.	%.	%.	%.
Western Australia	975,920	118,762	76,127	194,889	64·10	0·20	8,839	6,342	15,181	8·04	9·09	8·45
New South Wales	310,700	723,035	656,496	1,379,531	90·80	4·44	4,040	10,901	14,941	0·56	1·69	1·09
Victoria	87,884	607,283	601,422	1,208,705	99·03	13·75	4,398	6,921	11,319	0·73	1·16	0·95
Queensland ...	668,497	284,347	226,168	510,515	79·54	0·76	10,699	7,863	18,562	3·91	3·60	3·77
South Australia* ...	903,690	185,372	179,423	364,795	96·79	0·40	873	2,165	3,038	0·47	1·22	0·84
Tasmania	26,215	90,267	83,966	174,233	93·02	6·65	387	867	1,254	0·43	1·04	0·72
New Zealand ...	† 104,751	414,223	373,434	787,657	90·15	7·52	8,667	8,308	16,975	2·14	2·28	2·20
Total Australasia	3,077,657	2,423,289	2,197,036	4,620,325	90·66	1·50	37,903	43,367	81,270	1·59	2·01	1·79
1902.												
Western Australia	975,920	130,628	84,529	215,157	64·71	0·22	11,866	8,402	20,268	9·99	11·04	10·40
New South Wales	310,700	739,429	668,284	1,407,713	90·38	4·53	16,394	11,788	28,182	2·27	1·80	1·46
Victoria	87,884	602,384	603,129	1,205,513	100·12	13·72	−4,899	1,707	−3,192	−0·81	0·28	−0·26
Queensland ...	668,497	285,482	229,369	514,851	80·34	0·77	1,135	3,201	4,336	0·40	1·42	0·85
South Australia* ...	903,690	185,451	180,340	365,791	97·24	0·40	79	917	996	0·04	0·51	0·27
Tasmania	26,215	92,034	85,043	177,077	92·40	6·75	1,767	1,077	2,844	1·96	1·28	1·63
New Zealand ...	104,751	425,908	382,021	‡ 807,929	89·69	7·71	11,685	8,587	20,272	2·82	2·30	2·57
Total Australasia	3,077,657	2,461,316	2,232,715	4,694,031	90·71	1·52	38,027	35,679	73,706	1·57	1·62	1·60

* Including the Northern Territory. † By Proclamation dated 10th June, 1901, the area of the Colony was increased by 250 square miles, through the inclusion of the Cook group and other islands. ‡ Exclusive of 43,143 Maoris and 12,292 residents of Cook and other Pacific Islands.

Digitized by Google

No. 3.—Estimated Mean Population for the Years 1901 and 1902.

State or Colony.	Mean Population for the Year.			Number of Females to 100 Males.
	Males.	Females.	Total.	
1901.	No.	No.	No.	
Western Australia	115,391	73,212	188,603	63·45
New South Wales	721,015	651,045	1,372,060	90·30
Victoria	604,890	598,070	1,202,960	98·87
Queensland	281,699	223,996	505,695	79·52
South Australia *	184,125	178,055	362,180	96·70
Tasmania	90,073	83,533	173,606	92·74
New Zealand	408,926	369,042	777,968	90·25
Mean total for Australasia	2,406,119	2,176,953	4,583,072	90·48
1902.				
Western Australia	126,562	80,580	207,142	63·67
New South Wales	731,232	662,390	1,393,622	90·59
Victoria	604,834	602,276	1,207,110	99·58
Queensland	285,525	228,087	513,612	79·88
South Australia *	184,325	179,417	363,742	97·34
Tasmania	91,150	84,505	175,655	92·71
New Zealand	420,065	377,728	797,793	89·92
Mean total for Australasia	2,443,693	2,214,983	4,658,676	90·64

* Including the Northern Terri o

No. 4.—Births registered during 1901 and 1902.

State or Colony.	Mean Population.	Total Births.			Birth Rate. Number of births per 1000 of the mean population for the year.	Illegitimate Births Registered.			
		Males.	Females.	Total.		Males.	Females.	Total.	Percentage of total births.
1901.		No.	No.	No.	No.	No.	No.	No.	%
Western Australia	188,603	2,946	2,772	5,718	30·32	111	111	222	3·88
New South Wales	1,372,060	19,149	18,726	37,875	27·60	1,411	1,301	2,712	7·16
Victoria	1,202,960	15,876	15,132	31,008	25·78	*	*	1,729	5·58
Queensland ...	505,695	7,281	7,022	14,303	28·28	440	408	848	5·93
South Australia †	362,180	4,687	4,424	9,111	25·16	181	180	361	3·96
Tasmania	173,606	2,570	2,360	4,930	28·40	148	145	293	5·94
New Zealand ...	777,968	10,471	10,020	20,491	26·34	496	441	937	4·57
Total for 1901	4,583,072	62,980	60,456	123,436	26·93	...	...	7,102	5·75
1902.									
Western Australia	207,142	3,241	2,991	6,232	30·09	130	117	247	3·96
New South Wales	1,393,622	19,322	18,513	37,835	27·15	1,271	1,226	2,497	6·60
Victoria	1,207,110	15,583	14,878	30,461	25·23	*	*	1,677	5·51
Queensland ...	513,612	7,279	6,937	14,216	27·68	430	429	859	6·04
South Australia †	363,742	4,587	4,360	8,947	24·60	201	188	389	4·
Tasmania	175,655	2,604	2,481	5,085	28·95	150	161	311	6
New Zealand ...	797,793	10,653	10,002	20,655	25·89	473	448	921	4
Total for 1902	4,658,676	63,269	60,162	123,431	26·49	...	...	6,901	5

* Sexes not distinguished. † Including the Northern Territory.

Digitized by Google

No. 5.—Deaths registered during 1901 and 1902.

State or Colony.	Mean Population.	Total Deaths.			Death Rate.	Deaths under one year registered.					Deaths under five years registered.			
		Males.	Females.	Total.	Number of deaths per 1,000 of the mean population for the year.	Males.	Females.	Total.	Infantile Mortality. Percentage of deaths under one year to total births.	Percentage of deaths under one year to total deaths.	Males.	Females.	Total.	Percentage of deaths under five years to total deaths.
		No.	No.	No.	No.	No.	No.	No.	%	%	No.	No.	No.	%
1901.														
Western Australia	188,603	1,653	866	2,519	13·36	412	325	737	12·89	29·26	540	417	957	37·99
New South Wales...	1,372,060	9,327	6,694	16,021	11·68	2,097	1,832	3,929	10·37	24·52	2,712	2,439	5,151	32·15
Victoria	1,202,960	9,035	6,869	15,904	13·22	1,788	1,404	3,192	10·29	20·07	2,330	1,921	4,251	26·73
Queensland ...	505,695	3,838	2,169	6,007	11·88	808	650	1,458	10·19	24·27	1,029	885	1,914	31·86
South Australia *...	362,180	2,289	1,776	4,065	11·22	523	388	911	10·00	22·41	661	515	1,176	28·93
Tasmania	173,606	994	811	1,805	10·40	260	179	439	8·90	24·32	306	225	531	29·42
New Zealand ...	777,968	4,418	3,216	7,634	9·81	823	640	1,463	7·14	19·16	1,056	820	1,876	24·57
Total for 1901 ...	4,583,072	31,554	22,401	53,955	11·77	6,711	5,418	12,129	9·83	22·48	8,634	7,222	15,856	29·39
1902.														
Western Australia	207,142	1,832	991	2,823	13·63	496	389	885	14·20	31·35	633	510	1,143	40·49
New South Wales...	1,393,622	9,535	7,111	16,646	11·94	2,249	1,903	4,152	10·97	24·94	2,955	2,546	5,501	33·05
Victoria	1,207,110	9,152	7,025	16,177	13·40	1,793	1,515	3,308	10·86	20·45	2,348	2,013	4,361	26·96
Queensland ...	513,612	3,924	2,280	6,204	12·08	780	644	1,424	10·02	22·95	984	834	1,818	29·30
South Australia *...	363,742	2,389	1,925	4,314	11·86	468	373	841	9·40	19·49	703	553	12,56	29·11
Tasmania	175,655	1,044	870	1,914	10·90	222	180	402	7·91	21·00	276	224	500	26·12
New Zealand ...	797,793	4,890	3,485	8,375	10·50	952	760	1,712	8·29	20·44	1,231	1,059	2,290	27·34
Total for 1902 ...	4,658,676	32,766	23,687	56,453	12·12	6,960	5,764	12,724	10·31	22·54	9,130	7,739	16,869	29·88

* Including the Northern Territory.

Digitized by Google

No. 6.—Marriages Registered during 1901 and 1902.

State or Colony.	Mean Population.	Marriages celebrated by Ministers of Religion.	Marriages celebrated by Registrars.	Total.	Marriage Rate. Number of Marriages per 1,000 of the mean population for the Year.	Percentage of Marriages performed by Registrars to total marriages.	Marriages of Minors. Males.	Females.	Total.	Percentage of Minors married to total number married. Males.	Females.	Persons.	Mark Signatures of Contracting Parties. Males.	Females.	Total.	Percentage of Mark Signatures to total number married. Males.	Females.	Persons.
		No.	No.	No.	No.	%	No.	No.	No.	%	%	%	No.	No.	No.	%	%	%
1901.																		
Western Australia	188,603	1,630	191	1,821	9·66	10·49	30	338	368	1·65	18·56	10·10	18	18	36	0·99	0·99	0·99
New South Wales	1,372,145	10,240	298	10,538	7·68	2·83	351	2,546	2,897	3·33	24·16	13·75	142	141	283	1·35	1·34	1·34
Victoria	1,292,960	8,235	171	8,406	6·99	2·03	191	1,323	1,514	2·27	15·74	9·01	47	42	89	0·56	0·50	0·53
Queensland	505,695	3,108	233	3,341	6·61	6·97	83	787	870	2·48	23·56	13·02	72	99	171	2·16	2·96	2·56
South Australia* ...	363,180	2,181	128	2,309	6·38	5·54	71	439	510	3·07	19·01	11·04	31	13	44	1·34	0·56	0·95
Tasmania	173,606	1,319	19	1,338	7·71	1·42	58	356	414	4·33	26·61	15·47	65	45	110	4·86	3·36	4·11
New Zealand ...	777,968	5,078	1,017	6,095	7·83	16·69	118	1,046	1,164	1·94	17·16	9·55	28	38	66	0·46	0·62	0·54
Total for 1901 ...	4,583,157	31,791	2,057	33,848	7·39	6·08	902	6,835	7,737	2·66	20·19	11·43	403	396	799	1·19	1·17	1·18
1902.																		
Western Australia	207,142	1,801	223	2,024	9·77	11·02	35	393	428	1·73	19·42	10·57	12	16	28	0·59	0·79	0·69
New South Wales	1,393,622	10,197	289	10,486	7·52	2·76	309	2,372	2,681	2·95	22·62	12·78	135	120	255	1·29	1·14	1·22
Victoria	1,267,110	8,355	122	8,477	7·02	1·44	155	1,294	1,449	1·83	15·26	8·55	57	46	103	0·67	0·54	0·61
Queensland... ...	513,612	3,013	230	3,243	6·31	7·09	85	811	896	2·62	25·01	13·81	50	75	125	1·54	2·31	1·93
South Australia* ...	363,742	2,276	107	2,383	6·55	4·49	78	460	538	3·27	19·30	11·29	33	22	55	1·38	0·92	1·15
Tasmania ...	175,655	1,298	15	1,313	7·47	1·14	39	345	384	2·97	26·28	14·62	52	30	82	3·96	2·28	3·12
New Zealand ...	797,793	5,338	1,056	6,394	8·01	16·51	89	1,061	1,150	1·39	16·59	8·99	16	28	44	0·25	0·44	0·34
Total for 1902 ...	4,658,676	32,278	2,042	34,320	7·37	5·95	790	6,736	7,526	2·30	19·63	10·96	355	337	692	1·03	0·98	1·01

* Including the Northern Territory.

Digitized by Google

II.—PUBLIC FINANCE.

No. 7.—Revenue, Year ended 30th June, 1902.

Sources of Revenue.	Western Australia.	New South Wales.	Victoria.	Queensland.	a South Australia.	b Tasmania.	c New Zealand.	Total, Australasia.
	£	£	£	£	£	£	£	£
Taxation—								
Customs	d 1,273,125	d 2,323,999	d 1,976,245	d 1,135,562	d 625,637	d 335,401	2,201,116	9,871,085
Excise	d 62,489	d 488,732	d 400,280	d 162,100	d 73,010	d 37,739	90,233	1,314,583
Probate and Succession Duties ...	13,624	257,727	217,796	146,513	61,106	8,629	110,621	1,546,164
Other Stamp Duties	44,433	248,130	195,015		239	23,455	218,876	
Land Tax	...	306,298	97,862	...	82,738	42,209	312,836	841,943
Income Tax...	...	211,871	220,692	...	74,506	17,538	179,397	703,941
Dividend Tax	e 85,890	...	...	66,204	...	e 2,665	...	154,759
Other Taxation	29,635	124,916	86,972	64,054	49,197	17,019	...	371,793
Total Taxation	1,509,196	3,961,673	3,194,799	1,574,433	966,433	484,655	3,113,079	14,804,268
Special Public Services—								
Railways and Tramways	1,488,574	4,390,951	3,362,030	1,316,828	1,107,146	206,997	1,869,489	13,742,015
Post Office	d 115,984	d 665,549	d 521,922	d 205,512	d 150,580	d 84,115	281,097	2,024,759
Telegraphs and Telephones ...	d 109,768	d 207,763	d 69,548	d 107,393	d 127,232	d 7,496	207,476	836,676
Water Supply	15,084	264,172	38,675	...	108,946	...	3,972	430,799
Sewerage	...	132,758	...	...	...	...	...	132,758
Other	...	...	6,938	...	...	...	...	6,938
Total Public Services ...	1,729,360	5,661,193	3,999,113	1,629,733	1,403,904	298,608	2,362,034	17,173,945

Digitized by Google

Lands—								
Sales	36,723	1,225,196	256,287	219,310	41,130	35,698	68,011	1,882,355
Rental *f*	151,766	827,930	110,858	355,987	115,783	27,517	181,608	1,771,449
Total Lands	188,489	2,053,126	367,145	575,297	156,913	63,215	249,619	3,653,804
Interest—								
On Loans, Local Bodies	...	...	156,889	66,660	...	5,932	51,449	280,930
On Public Balances	6,885	19,614	29,558	90,779	23,356	2,671	44,816	217,679
tal Interest	6,885	19,614	186,447	157,439	23,356	8,603	96,265	498,609
Other Sources...	*g* 256,655	*g* 790,969	*g* 305,814	*g* 304,886	*g* 191,338	*g* 49,788	331,842	2,231,292
Total Revenue	*a* 3,690,585	*g* 12,486,575	*g* 8,053,318	*g* 4,241,788	*g* 2,831,944	*g* 904,869	6,152,839	38,361,918

a Including the Northern Territory. *b* State Revenue for year ended 31st December, 1901; Revenue received by Federal Government for year ended 30th June, 1902. *c* Year ended 31st March, 1902. *d* Revenue received by Federal Government. *e* Company Tax.
f Including Rental of Mining Lands. *g* Including Revenue received by Federal Government.

Digitized by Google

No. 8.—Expenditure from Consolidated Revenue, Year ended 30th June, 1902.

Heads of Expenditure.	Western Australia.	New South Wales.	Victoria.	Queensland.	a South Australia.	b Tasmania.	c New Zealand.	Total, Australasia.
	£	£	£	£	£	£	£	£
Interest, Sinking Fund, and Expenses on Public Debt	602,138	2,773,298	1,941,449	1,480,376	995,530	321,175	1,803,939	9,917,905
Railways and Tramways (Working Expenses)	1,269,619	2,806,161	2,052,264	990,751	731,072	173,422	1,280,997	9,304,286
Railways—Construction	...	1,100	...	...	...	...	...	1,100
Other Public Works	273,522	847,429	299,755	45,407	121,376	100,394	...	1,687,883
Post and Telegraphs	j 258,570	j 840,685	j 588,888	j 419,965	j 246,752	j 107,056	463,817	2,925,733
Mines	101,958	e 160,163	59,502	40,389	43,061	13,520	15,504	434,097
Customs	j 31,991	j 63,450	j 63,812	j 64,225	j 26,517	j 10,327	40,738	301,060
Defences	j 34,967	j 309,147	j 316,876	j 185,958	g 68,737	j 29,028	191,250	1,135,963
Police	123,724	400,953	271,561	184,873	84,874	39,126	120,629	1,225,740
Harbours, Rivers, Lights, Beacons, etc.	26,969	229,939	35,395	53,794	19,597	...	110,866	476,560
Water Supply and Sewerage ...	d	115,133	30,790	3,024	35,775	...	4,538	189,260
Quarantine	852	3,228	1,680	...	1,970	...	...	7,730
Education	102,359	852,200	690,237	328,723	182,820	58,797	539,317	2,754,453
Hospitals	89,263	211,219	} 334,819	135,546	{ 66,483	30,227	} 90,646	1,674,539
Charitable Institutions	26,227	f 629,059			{ 40,988	20,062		
All other Expenditure	k 548,857	k 2,260,333	k 1,768,574	k 740,581	k 516,285	k 112,368	h 1,252,674	7,199,672
Total Expenditure... ...	k 3,491,016	k 12,503,497	k 8,455,602	k 4,673,612	k 3,181, 37	k 1,015,502	i 5,914,915	39,235,981

a Including the Northern Territory. b State expenditure for year ended 31st December, 1901; expenditure by Federal Government for year ended 30th June, 1902. c Year ended 31st March, 1902. d Included under "other Public Works." e Mines and Agriculture. f Including Old-age Pensions administration, £453,279. g Expenditure by Federal Government, £58,670; the balance being State expenditure. h Including £19,000 debentures redeemed. i The expenditure of £500,000 transferred to Public Works Fund has been accounted for under Loan Expenditure (Table No. 9). j Expenditure by Federal Government. k Including expenditure by Federal Government.

Digitized by Google

No. 9.—Loan Expenditure—Year ended 30th June, 1902.

Heads of Expenditure.	Western Australia.	New South Wales.	Victoria.	Queensland.	a South Australia.	b Tasmania.	c New Zealand.	Total, Australasia.
	£	£	£	£	£	£	£	£
Railways and Tramways	578,985	2,243,672	467,937	751,451	118,674	80,948	1,333,941	5,575,608
Telegraphs and Telephones	...	39,287	...	17,551	12,456	11,520	31,729	112,543
Roads and Bridges...	740	150,777	...	g 179,217	185	77,536	434,239	842,694
Harbours, Rivers, and Lighthouses ...	182,962	1,698,387	...	21,362	14,782	8,453	d 12,159	1,938,105
Public Buildings	...	276,504	i 34,331	125,478	13,753	29,788	145,600	625,454
Defences	...	3,851	11,889	30,079	28,961	1,738	e 146,876	223,394
Water Supply ... ... }	731,989	{ 266,964	88,902	h	195,136	...	...	} 1,517,670
Sewerage ... ... }		{ 219,241	...	h	15,438	...	...	
Immigration	3,433	...	...	17,284	...	...	140	20,857
Other Public Works or purposes ...	47,714	...	283,255	19,267	166,694	132,011	786,083	1,435,024
Total Loans Expenditure (exclusive of Redemptions)	1,545,823	4,898,683	886,314	1,161,689	566,079	341,994	f 2,890,767	12,291,349

a Including the Northern Territory. b Year ended 31st December, 1901. c Year ended 31st March, 1902. d Including Harbour Defences. e Contingents. f Including £500,000 transferred from Consolidated Revenue Fund. g Including Loans to Local Bodies, principally for Roads and Bridges and Water Conservation. h Included under "Roads and Bridges." i Schools.

Digitized by Google

No. 10.—Loan Expenditure—Aggregate to 30th June, 1902.

Heads of Expenditure.	Western Australia.	New South Wales.	Victoria.	Queensland.	a South Australia.	b Tasmania.	c Total, Australasia.
	£	£	£	£	£	£	£
Railways and Tramways	7,547,950	45,414,483	37,898,290	22,434,859	13,451,493	3,991,177	130,738,252
Telegraphs and Telephones	269,308	1,294,887	...	1,015,222	992,214	141,717	3,713,348
Roads and Bridges	142,538	1,533,128	106,259	e 3,938,600	1,464,458	2,120,884	9,305,867
Harbours, Rivers, and Lighthouses ...	1,835,211	7,299,175	611,059	2,595,853	1,344,112	424,260	14,109,670
Public Buildings	63,876	3,994,247	d 1,881,330	1,356,893	829,650	760,954	8,886,950
Defences	...	1,422,957	149,324	364,166	289,290	127,834	2,353,571
Water Supply ... ... }	2,329,364	{ 5,919,101	8,570,030	f	4,128,050	...	} 26,001,978
Sewerage ... ... }		{ 4,445,937	..	f	609,496	...	}
Immigration	27,697	194,430	...	2,933,062	...	235,000	3,390,189
Other Public Works or purposes ...	1,216,011	493,502	983,146	1,692,075	2,686,034	786,326	7,857,094
Total Loans Expenditure (exclusive of Redemptions)	13,431,955	72,011,847	50,199,438	36,330,730	25,794,797	8,588,152	206,356,919

a Including the Northern Territory. b To 31st December, 1901. c Exclusive of New Zealand, for which Colony reliable information under this head is not available. d Including £1,129,112, Expenditure on Schools. e Including Loans to Local Bodies, principally for Roads and Bridges and Water Conservation. f Included under "Roads and Bridges."

Digitized by Google

No. 11.—Public Debt on 30th June, 1902.

State or Colony.	Debentures.	Inscribed Stock.	Funded Stock.	Treasury Bills.			Gross Indebtedness.	Accrued Sinking Fund.	Net Indebtedness.	Gross Indebtedness per Head.	Net Indebtedness per Head.
				For Public Works.	In Aid of Revenue.	Total Treasury Bills.					
	£	£	£	£	£	£	£	£	£	£ s. d.	£ s. d.
Western Australia ...	276,000	14,666,310	...	...	...	...	14,942,310	486,737	14,455,573	71 14 6	69 7 10
New South Wales ...	8,777,250	49,277,870	8,053,239	3,006,500	2,477,626	5,484,126	71,592,485	655,796	70,936,689	51 6 0	50 16 7
Victoria	8,684,395	40,724,562	...	1,000,000	525,000	1,525,000	50,933,957	389,782	50,544,175	42 4 2	41 17 8
Queensland	13,480,380	24,838,247	...	...	...	...	38,318,627	...	38,318,627	74 8 11	74 8 11
South Australia *a* ...	9,345,600	17,102,445	...	...	849,500	849,500	27,297,545	35,480	27,262,065	75 4 4	75 2 4
Tasmania *b*	3,133,500	5,962,235	...	...		...	*d* 9,095,735	186,446	8,909,289	52 4 1	51 2 8
New Zealand *c* ...	9,153,697	43,812,750	...	...	...	..	52,966,447	1,128,816	51,837,631	67 0 11	65 12 4
Total, Australasia	52,850,822	196,384,419	8,053,239	4,006,500	3,852,126	7,858,626	265,147,106	2,883,057	262,264,049	56 19 9	56 7 5

a Including the Northern Territory. *b* On 31st December, 1901. *c* On 31st March, 1902. *d* Includes £241,115 raised for redemption of Debentures and Stock falling due 1902 and 1903.

Digitized by Google

No. 12.—Due Dates of Public Debt Outstanding on 30th June, 1902.

When Due.	Western Australia.	New South Wales.	Victoria.	Queensland.	a South Australia.	b Tasmania.	c New Zealand.	Total, Australasia.
	£	£	£	£	£	£	£	£
Overdue	...	8,150	...	...	...	...	...	8,150
Due, 1902	...	409,300	...	...	...	167,441	260,100	836,841
„ 1903	31,500	1,003,700	1,275,000	...	65,000	168,794	480,000	3,023,994
„ 1904	...	58,000	5,482,000	...	379,100	24,840	1,448,950	7,392,890
„ 1905	17,600	2,903,800	25,000	...	605,400	177,486	1,670,800	5,400,086
„ 1906	...	1,224,900	25,000	...	37,500	233,811	949,766	2,470,977
„ 1907	...	...	4,025,000	...	1,037,500	26,418	1,759,800	6,848,718
„ 1908	...	1,450,000	2,025,000	...	1,951,100	343,815	400,438	6,170,353
„ 1909	...	1,799,500	25,000	...	3,122,700	115,466	523,000	5,585,666
„ 1910	d 1,334,380	2,863,700	25,000	...	60,300	20,892	493,324	4,797,596
„ 1911	...	...	25,000	...	68,300	1,024,661	2,843	1,120,804
„ 1912	...	7,583,049	25,000	...	85,000	1,000	...	7,694,049
„ 1913	...	...	4,025,000	1,466,500	46,300	546,650	496,300	6,580,750
„ 1914	...	...	...	...	35,000	800,000	331,800	1,166,800
„ 1915	...	...	...	11,728,800	35,000	...	3,800	11,767,600
„ 1916	...	...	...	...	1,963,300	100	12,700	1,976,100
„ 1917	...	...	3,195,619	...	1,363,800	...	...	4,559,419
„ 1918	...	12,826,200	...	...	1,474,400	...	...	14,300,600
„ 1919	...	245,050	4,000,000	..	26,000	...	...	4,271,050
„ 1920	...	...	6,000,000	...	336,300	300,000	...	6,636,300
„ 1921	...	..	1,000,000	...	...	170,161	500,000	1,670,161
„ 1922	...	...	g 63,000	...	...	...	...	63,000
„ 1923	...	...	h 8,026,995	..	..	...	...	8,026,995
„ 1924	...	16,698,065	...	12,978,834	1,651,300	...	...	31,323,199
„ 1925	..	222,255	...	...	...	100	...	222,355
„ 1926	...	...	i 7,107,000	...	...	67,600	...	7,174,600
„ 1927	2,500,000	...	...	...	...	...	...	2,500,000
„ 1929	...	...	...	...	200,000	...	29,150,302	29,350,302

Digitized by Google

„ 1930	...	...	...	3,704,800	...	...	...	3,704,800
„ 1931	*e* 1,876,000	...	...	...	...	...	...	1,876,000
„ 1933	...	9,686,300	...	...	...	...	...	9,686,300
„ 1934	975,930	...	...	...	...	...	...	975,930
„ 1935	*f* 6,880,000	9,600,000	...	...	*k* 1,560,400	...	...	18,040,400
„ 1936	*e* 1,100,000	...	...	...	*l* 3,354,800	...	...	4,454,800
„ 1939	...	...	...	...	2,719,800	...	...	2,719,800
„ 1940	...	...	...	...	...	4,906,500	6,161,167	11,067,667
„ 1945	...	...	...	2,000,000	...	...	8,032,957	10,032,957
„ 1947	...	...	...	4,498,693	...	...	...	4,498,693
„ 1949	...	...	*j* 4,559,343	...	...	...	...	4,559,343
„ 1950	...	...	...	946,000	...	...	...	946,000
„ 1951	...	...	...	1,000,000	...	...	...	1,000,000
Permanent...	...	2,700	...	...	...	...	...	2,700
Interminable	...	530,190	...	...	...	...	...	530,190
Annual payments... ...	...	2,477,626	...	...	...	...	...	2,477,626
Annual Drawings ...	226,900	...	...	...	...	...	288,400	515,300
Indefinite	...	...	...	...	*m* 5,119,245	...	...	5,119,245
Total	14,942,310	71,592,485	50,933,957	38,318,627	27,297,545	9,095,735	52,966,447	265,147,106

a Including the Nor hern Territory. *b* Amount outstanding on 31st December, 1901. *c* Amount outstanding on 31st March, 1902. *d* Of this amount £460,230 is redeemable at par at the option of the Government at any time within four years prior to this date, on 12 calendar months notice being given. *e* Redeemable at par at the option of the Government at any time within 20 years prior to this date, on 12 calendar months' notice being given. *f* £4,500,000 redeemable at par at the option of the Government at any time within 20 years prior to this date, and £2,380,000 at any time within 15 years prior, 12 calendar months' notice to be given in either case. *g* Redeemable at par at the option of the Government 10 years prior to this date. *h* Of this amount £746,795 is redeemable at par at the option of the Government 10 years prior to this date. *i* £2,107,000 redeemable at par at the option of the Government 15 years prior to this date, and £5,000,000 redeemable five years prior. *j* Redeemable at par at the option of the Government 20 years prior to this date. *k* Redeemable at any time between 1st October, 1916, and 1st April, 1935, upon six months' notice being given. *l* £839,500 redeemable at any time between 1st January, 1916, and 1st January, 1936, upon six months' notice being given; £2,182,400 redeemable at any time between 1st April, 1917, and 1st April, 1936, upon six months' notice being given. *m* Redeemable on, or any time after, 1st January, 1916, upon six months' notice being given by the Government.

Digitized by Google

No. 13.—Rates of Interest payable on Loans outstanding on 30th June, 1902.

State or Colony.	Nominal amount of Loans overdue not bearing Interest.	Nominal amount of Loans bearing interest at								Total.	Average rate.
		6 per cent.	5 per cent.	4½ per cent.	4 per cent.	3¾ per cent.	3½ per cent.	3¼ per cent.	3 per cent.		
	£	£	£	£	£	£	£	£	£	£	%
Western Australia ...	...	...	49,100	73,600	3,005,230	...	4,464,380	...	7,350,000	14,942,310	3·36
New South Wales ...	8,150	12,300	460,000	3,700	22,196,940	...	32,300,197	...	16,611,198	71,592,485	3·55
Victoria	...	...	...	5,000,000	24,060,795	...	12,500,000	275,000	9,098,162	50,933,957	3·74
Queensland	...	...	...	...	21,384,300	...	11,535,634	...	5,398,693	38,318,627	3·71
South Australia *a* ...	...	533,900	290,000	...	16,302,400	...	4,212,500	...	5,958,745	27,297,545	3·75
Tasmania *b*	...	3,100	100	...	4,129,600	...	4,207,107	24,918	730,910	9,095,735	3·69
New Zealand *c* ...	...	56,000	609,400	52,900	33,427,852	349,000	10,438,338	...	8,032,957	52,966,447	3·78
Total, Australasia	8,150	605,300	1,408,600	5,130,200	124,507,117	349,000	79,658,156	299,918	53,180,665	265,147,106	3·67

a Including the Northern Territory. *b* On 31st December, 1901. *c* On 31st March, 1902.

Digitized by Google

No. 14.—Shipping, Imports, and Exports, 1902.

State or Colony.	Shipping. Entered. No.	Shipping. Entered. Tonnage.	Shipping. Cleared. No.	Shipping. Cleared. Tonnage.	Imports.	Exports. Domestic Produce.	Exports. Other Produce.	Exports. Total.
					£	£	£	£
Western Australia	763	1,671,169	765	1,686,905	7,218,352	8,871,676	179,682	9,051,358
New South Wales	3,164	4,390,086	3,002	4,338,058	25,974,210	17,248,494	6,295,557	23,544,051
Victoria	2,278	3,366,485	2,286	3,372,555	18,270,245	13,823,939	4,386,584	18,210,523
Queensland	780	1,035,492	769	1,032,119	7,352,538	8,732,058	438,965	9,171,023
South Australia *a*	1,060	2,031,082	1,103	2,100,194	6,181,000	4,959,664	2,930,408	7,890,072
Tasmania	964	887,485	944	879,730	2,442,745	3,227,777	16,731	3,244,508
New Zealand	638	1,089,179	611	1,048,770	11,326,723	13,498,599	146,378	13,644,977

a Including the Northern Territory.

Digitized by Google

No. 15.—Exports of Wool, the Produce of each State or Colony, 1902.

State or Colony.	Export of Wool—Produce of State or Colony.				
	Washed and Scoured.		Greasy.		Total Value.
	Quantity.	Value.	Quantity.	Value.	
	lbs.	£	lbs.	£	£
Western Australia	447,910	28,928	12,484,361	429,150	458,078
New South Wales	30,014,656	2,030,251	157,223,829	5,276,559	7,306,810
Victoria	2,620,877	125,512	44,033,521	1,476,665	1,602,177
Queensland	12,219,040	728,968	17,436,038	575,232	1,304,200
South Australia *a*	2,615,963	130,280	31,730,537	937,782	1,068,062
Tasmania	...	...	8,348,584	262,251	262,251
New Zealand	41,990,605	1,123,824	118,428,418	2,230,739	3,354,563
Total, Australasia	89,909,051	4,167,763	389,685,288	11,188,378	15,356,141

a Including the Northern Territory.

Digitized by Google

State or Colony.	Gold.		Silver.		Bronze.	Total Value.
	Bullion, etc.	Coin.	Bullion, etc.	Coin.	Coin.	
IMPORTS.						
	£	£	£	£	£	£
Western Australia	c	c	c	b 17,340	c	17,340
New South Wales	f 2,791,719	883,231	336	52,587	3,007	3,730,880
Victoria	1,245,806	114,380	1,418	28,250	2,055	1,391,909
Queensland	23,220	308,000	127	6,300	453	338,100
South Australia a	3,148	9,000	7	900	...	13,055
Tasmania	...	211,345	...	12,850	480	224,675
New Zealand	...	346,030	322	21,402	1,253	369,007
EXPORTS.						
Western Australia	3,318,958	4,149,869	19,240	...	...	7,488,067
New South Wales	g 517,038	3,108,523	117,360	53,816	1,304	3,798,041
Victoria	196,036	4,109,661	167	13,953	585	4,320,402
Queensland	2,457,439	207,298	e 86,248	6,070	...	2,757,055
South Australia a	70,251	52,000	...	200	...	122,451
Tasmania	173,928	...	...	...	...	173,928
New Zealand	1,951,426	3,718	71,975	5,800	...	2,032,919
EXCESS OF EXPORTS OVER IMPORTS OF COIN AND BULLION.						
Western Australia	3,318,958	4,149,869	19,240	d 17,340	...	7,470,727
New South Wales	d 2,274,681	2,225,292	117,024	1,229	d 1,703	67,161
Victoria	d 1,049,770	3,995,281	d 1,251	d 14,297	d 1,470	2,928,493
Queensland	2,434,219	d 100,702	86,121	d 230	d 453	2,418,955
South Australia a	67,103	43,000	d 7	d 700	...	109,396
Tasmania	173,928	d 211,345	...	d 12,850	d 480	d 50,747
New Zealand	1,951,426	d 342,312	71,653	d 15,602	d 1,253	1,663,912
Total Australasia	4,621,183	9,759,083	292,780	d 59,790	d 5,359	14,607,897

a Including the Northern Territory. b Given in Customs returns as "Bullion and Coin," the kind of metal not being distinguished. c See note b.
d Excess of imports over exports. e Including silver-gold bullion. f Includes £295,803 quartz and concentrates. g Includes £1,741 quartz and concentrates.

Digitized by Google

IV.—LAND SETTLEMENT, AGRICULTURE, AND LIVE STOCK.

No. 17.—Agriculture—Area under Crop during Season 1902–1903.

Crop.	Western Australia.	New South Wales.	Victoria.	Queensland.	a South Australia.	Tasmania.	New Zealand.	Total, Australasia.
	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.
Wheat	92,398	1,279,760	1,994,271	1,880	1,746,842	40,898	194,355	5,350,404
Oats	10,334	42,992	433,489	78	50,296	55,058	483,659	1,075,906
Barley	3,783	4,557	37,716	430	21,493	8,281	27,921	104,181
Maize	109	202,437	10,906	89,923	...	...	12,038	315,413
Beans, Pease, etc.	405	845	8,085	84	5,452	11,327	11,637	37,835
Other Cereals	463	5,204	1,487	60	...	771	1,279	9,264
Potatoes	2,084	19,444	49,706	2,899	7,763	34,625	31,408	147,929
Other Root Crops	218	607	7,704	1,847	...	6,381	523,036	539,793
Hay	105,791	491,918	580,884	20,068	325,789	66,038	69,342	1,659,830
Green Forage	636	109,287	30,720	51,279	14,937	3,355	205,357	415,571
Grass Seed	...	...	1,568	3	...	3,879	55,765	61,215
Sugar Cane { Productive	...	8,758	...	59,102	...	...	...	67,860
Sugar Cane { Unproductive	...	11,402	...	26,236	...	...	...	37,638
Vines { Productive	2,844	7,742	25,529	1,302	21,692	...	705	64,648
Vines { Unproductive	684	1,048	2,845	257		...	...	
Tobacco	...	317	171	722	...	...	...	1,210
Hops	...	...	213	...	...	665	790	1,668
Orchards	6,872	48,019	50,478	3,515	17,376	14,568	26,486	199,672
Market Gardens	b 3,099	8,263	7,937		9,489	...	3,570	
All other Crops	272	6,492	2,859	15,698	3,464	1,077	c 81,361	111,223
Total Land under Crop	229,992	2,249,092	3,246,568	275,383	2,224,593	246,928	1,728,709	10,201,290

a Including the N. [illegible]

No. 18.—Agriculture—Total Yields of Principal Crops for Season [illegible]

Crop.	Western Australia.	New South Wales.	Victoria.	Queensland.	a South Australia.	Tasmania.	New Zealand.	Total, Australasia.
Wheat ... ... (bushels)	985,559	1,585,097	2,569,364	6,165	6,354,912	876,971	7,457,915	19,835,983
Oats ... ... "	167,882	351,758	4,402,982	520	620,823	1,752,745	21,766,708	29,063,418
Barley ... ... "	46,255	18,233	561,144	3,595	317,155	201,133	1,136,232	2,283,747
Maize ... ... "	2,110	3,049,269	750,524	1,033,329	...	...	607,609	5,442,841
Beans, Pease, etc. ... "	5,557	31,250	141,888	6,087	89,654	224,220	391,021	889,677
Other Cereals ... ... "	4,419	42,071	21,179	1,331	...	10,945	38,370	118,315
Potatoes ... ... (tons)	6,488	30,732	168,759	3,257	28,312	163,518	193,267	594,333
Other Root Crops ... "	911	2,222	50,241	7,165	...	76,015	b	c 136,554
Hay ... ... "	94,007	243,379	601,272	23,181	308,825	89,210	b	c 1,359,874
Wine ... ... (gallons)	158,853	806,140	1,547,188	100,852	2,145,525	...	...	4,758,558

a Including the Northern Territory. b No information available. c Exclusive of New Zealand.

No. 19.—Agriculture—Average Yield per Acre of Principal Crops for Season 1902–1903.

Crop.	Western Australia.	New South Wales.	Victoria.	Queensland.	a South Australia.	Tasmania.	New Zealand.	Total, Australasia.
Wheat ... ... (bushels per acre)	10·67	1·24	1·29	3·28	3·64	21·44	38·38	3·71
Oats ... ... " "	16·25	8·18	10·57	6·67	12·34	31·83	45·00	27·01
Barley ... ... " "	12·23	4·00	14·88	8·36	14·76	24·28	40·69	21·92
Maize ... ... " "	19·36	15·06	6·88	11·49	...	...	50·48	17·26
Beans, Pease, etc. " "	13·72	36·98	17·54	72·45	16·44	19·80	33·60	23·52
Other Cereals ... " "	9·54	8·08	14·24	22·18	...	14·20	30·00	12·77
Potatoes ... ... (tons per acre)	3·11	1·58	3·39	1·12	3·65	4·72	6·15	4·02
Other Root Crops " "	4·18	3·66	6·52	3·88	...	11·91	b	c 8·15
Hay ... ... " "	0·89	0·49	1·04	1·16	0·95	1·35	b	c 0·85

a Including the Northern Territory. b No information available. c Exclusive of New Zealand.

No. 20.—Live Stock, 1902.

Live Stock.	Western Australia. a	New South Wales. a	Victoria. b	Queensland. a	South Australia. c d	Tasmania. e	New Zealand.	Total, Australasia.
Horses	80,158	450,125	392,237	399,122	179,413	33,465	f 286,955	1,821,475
Cattle	437,136	1,741,226	1,602,384	2,543,471	519,163	168,385	f 1,460,663	8,472,428
Sheep	2,704,880	26,649,424	10,841,790	7,213,985	4,922,662	1,679,518	g 20,342,727	74,354,986
Pigs	52,883	192,097	350,370	77,202	83,791	52,092	f 193,740	1,002,175

a Number on 31st December, 1902. b Number on 31st March, 1901. c Including the Northern Territory. d Number on 31st March, 1903. e Number on 1st March, 1903. f Number in November, 1902. g Number in April, 1902.

No. 21.—Dairying during Year ended 31st December, 1902.

Dairy Produce.	Western Australia.	New South Wales.	Victoria.	Queensland.	Tasmania.	Total. a
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Butter	321,462	29,950,977	39,227,754	4,851,362	699,526	75,051,081
Cheese	1,592	4,148,038	3,849,581	952,013	349,614	9,300,818
Bacon and Ham	246,827	8,905,856	14,438,370	6,512,952	410,760	30,604,765

a Information for South Australia and New Zealand not available.

Digitized by Google

No. 22.—Land Settlement on 31st December, 1902.

Particulars.	Western Australia.	New South Wales.	Victoria.	Queensland.	South Australia. a	Tasmania.	New Zealand. b	Total, Australasia.
	acres.	acres.	acres.	acres.	acres.	acres.	acres.	acres.
Area absolutely or conditionally Alienated	9,856,592	48,507,192	24,058,181	16,824,355	14,207,490	4,955,550	24,029,976	142,439,336
Area Leased or Licensed	112,137,932	131,099,305	17,244,278	289,495,477	197,570,367	1,518,895	16,254,847	765,321,101
Area neither Alienated nor Leased	502,594,276	19,241,503	14,943,301	121,518,248	366,583,743	10,303,555	c 26,576,617	1,061,761,243
Total Area ...	624,588,800	198,848,000	56,245,760	427,838,080	578,361,600	16,778,000	d 66,861,440	1,969,521,680

a Including the Northern Territory. b On 31st March, 1903. c Including 9,000,000 acres native lands. d Excluding the Cook group and other islands added to the colony by proclamation dated 10th June, 1901.

V.—MINERAL PRODUCTION.

No. 23.—Value of Minerals produced, 1902.

Minerals.	Western Australia.	New South Wales.	Victoria.	Queensland.	South Australia. a	Tasmania.	New Zealand.	Total, Australasia.
	£	£	£	£	£	£	£	£
Gold	7,947,663	684,970	3,062,028	2,720,639	95,129	301,573	1,951,433	16,763,435
Silver	9,199	105,360	5,750	70,145	20	1,075,007	71,975	3,590,069
Silver-lead, etc.	277	1,334,819	...	b 2,706	19,740		...	
Copper	8,090	307,806	...	189,200	389,975		...	
Tin	39,783	59,593	500	116,171	6,078	206,607	...	428,732
Coal	86,188	2,206,598	155,850	172,286	...	28,600	741,759	3,391,281
Other Minerals	3,380	378,883	65,630	39,453	65,576	47,209	456,455	1,056,586
Total	8,094,580	5,078,029	3,289,758	3,310,600	576,518	1,658,996	3,221,622	25,230,103

a Including the Northern Territory. b Lead.

Digitized by Google

VI. POST AND TELEGRAPHS.

No. 24.—Offices, Revenue and Expenditure, 1902.

State or Colony.	Number of Post Offices open on 31st December, 1902.	Revenue for Year ended 31st December, 1902.			Expenditure for Year ended 31st December, 1902.
		Postal and Telegraph Branches.	Telephone Branch.	Total.	
		£	£	£	£
Western Australia	197	203,127	29,464	232,591	257,283
New South Wales	1,693	798,236	96,278	894,514	759,619
Victoria	1,645	557,563	76,326	633,889	550,227
Queensland	1,300	290,034	24,619	314,653	420,904
South Australia *a b*	702	242,086	21,925	264,011	237,532
Tasmania	369	81,726	6,704	88,430	101,431
New Zealand *c*	1,807	462,948	62,151	525,099	487,815
Total, Australasia ..	7,713	2,635,720	317,467	2,953,187	2,814,811

Digitized by Google

No. 25.—Letters, Post Cards, Newspapers, and Parcels and Packages, 1902.

Particulars.	States of the Commonwealth of Australia.						New Zealand.
	Western Australia.	New South Wales.	Victoria.	Queensland.	a South Australia.	Tasmania.	
LETTERS AND POST CARDS.							
Inland (posted)	13,005,204	75,852,084	85,605,287	17,614,393	16,437,843	6,099,517	52,894,488
Interstate received	2,395,684	5,102,131	4,904,470	1,991,939	1,919,541	988,020	b 1,192,762
Received from other places ...	602,167	2,551,893	1,757,202	831,199	292,623	252,282	2,279,289
Interstate despatched ...	1,655,286	5,129,527	4,840,160	3,007,006	1,760,020	1,744,752	c 1,063,803
Despatched to other places ...	492,671	2,145,760	1,235,388		359,910	294,867	1,586,456
Total	18,151,012	90,781,395	98,342,507	23,444,537	20,769,937	9,379,438	59,016,798
NEWSPAPERS.							
Inland (posted)	4,621,341	37,775,680	23,200,332	8,717,366	1,789,973	4,427,758	11,532,886
Interstate received	3,194,979	3,642,680	2,139,672	1,832,350	1,242,518	1,600,606	b 1,383,934
Received from other places ...	1,054,761	1,433,930	d 3,823,147	1,428,607	774,523	337,812	3,740,495
Interstate despatched ...	796,849	3,472,890	7,182,888	1,149,283	749,762	321,704	c 617,110
Despatched to other places ...	248,614	1,438,180	1,115,640		147,456	182,022	1,242,851
Total	9,916,544	47,763,360	37,461,679	13,127,606	10,704,232	6,869,902	18,517,276
PARCELS AND PACKAGES.							
Inland (posted)	3,684,376	13,760,585	10,174,784	5,674,055	645,361	1,561,340	16,617,723
Interstate received	692,609	e 2,171,526	1,003,368	555,316	438,108	536,146	b 334,112
Received from other places ...	207,373	f 1,063,329	g	611,339	h 480	374,132	1,470,408
Interstate despatched ...	489,062	e	1,781,194	915,882	351,620	103,851	c 163,064
Despatched to other places ...	90,614	f	550,049		80,442	50,326	332,687
Total	5,164,034	16,995,440	13,509,395	7,756,592	1,516,011	2,625,795	18,917,994

a Including the Northern Territory. b Received from States of the Commonwealth of Australia. c Despatched to States of the Commonwealth of Australia. d Including parcels and packages. e "Interstate despatched" are included with "Interstate received." f "Despatched to other places" are included with "Received from other places." g *See* note d. h Northern Territory only; those for South Australia proper were not recorded.

Digitized by Google

VII.—RAILWAYS.

No. 26.—Government Railways, 1902.

State or Colony.	Miles open at end of year.	Miles being constructed.	Average miles open during year.	Train miles run.	Cost of construction and equipment.	Gross receipts during year.				Working expenses during year.	Locomotives working.	Vehicles of all kinds.	
						Coaching.	Goods.	Miscellaneous.	Total.			Passenger.	Goods and Live Stock.
	No.	No.	No.	No.	£	£	£	£	£	£	No.	No.	No.
Western Australia *a*	1,360	160	1,356	4,507,919	7,410,426	381,295	1,085,897	54,237	1,521,429	1,256,370	274	260	5,285
New South Wales *a* ...	3,026	425	2,953	11,649,059	40,565,073	1,367,796	2,263,837	37,053	3,668,686	2,267,369	518	1,073	11,183
Victoria *a*	3,286	127	3,250	11,284,944	40,570,204	1,580,218	1,719,462	68,163	3,367,843	2,166,119	542	1,189	10,101
Queensland *b* ..	2,828	213	2,814	5,511,188	20,802,110	338,070	822,439	127,826	1,288,335	914,742	336	434	7,226
South Australia *a c* ...	1,882	...	1,882	4,226,413	14,435,794	372,709	689,041	35,947	1,097,697	724,166	351	438	6,256
Tasmania *b*	469	...	468	902,918	3,900,997	99,115	116,061	18,034	233,210	173,292	75	172	1,274
New Zealand *d* ...	2,291	194	2,262	5,443,333	19,081,735	712,971	1,189,101	71,966	1,974,038	1,343,415	372	751	12,992
Total, Australasia...	15,142	1,119	14,985	43,525,774	146,766,339	4,852,174	7,885,838	413,226	13,151,238	8,845,473	2,468	4,317	54,317

a Year ended 30th June, 1902. *b* Year ended 31st December, 1902. *c* Including the Northern Territory. *d* Year ended 31st March, 1903.

Digitized by Google

VIII.—LAW AND CRIME.

No. 27.—Probate and Bankruptcy, 1902.

State or Colony.	Probates and Letters of Administration.		Bankruptcies.				
			Petitions.			Liabilities.	Assets.
	Estates.	Value.	Compulsory.	Voluntary.	Total.		
	No.	£	No.	No.	No.	£	£
Western Australia	347	488,058	21	55	76	51,548	17,247
New South Wales	2,782	5,807,620	112	373	485	281,204	124,427
Victoria	3,976	7,571,482	32	371	403	359,802	267,259
Queensland	590	932,854	28	406	434	88,311	30,321
South Australia a	913	1,790,102	8	27	35	40,798	25,138
Tasmania	230	299,408	5	55	60	44,213	29,562
New Zealand	1,439	2,714,237	24	181	205	120,401	61,604
Total, Australasia	10,277	19,603,761	230	1,468	1,698	986,277	555,558

a Including the Northern Territory.

Digitized by Google

No. 28.—Cases tried by Magistrates, 1902.

State or Colony.	Offences against the person.	Offences against property.	Drunkenness.	Other Offences.	Total.
	No.	No	No.	No.	No.
Western Australia	845	1,889	3,311	10,398	16,443
New South Wales	*b* 4,183	5,962	21,577	28,651	60,373
Victoria	2,121	3,882	14,540	26,337	*c* 46,880
Queensland	1,908	2,375	8,123	8,709	21,115
South Australia *a*	252	509	2,431	3,416	6,608
Tasmania	248	618	636	4,669	6,171
New Zealand	1,114	3,083	8,311	15,568	*d* 28,076
Total, Australasia	10,671	18,318	58,929	97,748	185,666

a Including the Northern Territory. *b* Including 267 cases "against person and property." *c* Including summons cases.
d Exclusive of 451 trials of Maoris, details of which are not available.

Digitized by Google

No. 29.—Summary Convictions by Magistrates, 1902.

State or Colony.	Offences against the person.	Offences against property.	Drunkenness.	Other Offences.	Total.
	No.	No.	No.	No.	No.
Western Australia	406	1,053	2,036	8,041	11,536
New South Wales	b 1,657	3,530	21,472	24,117	50,776
Victoria	1,062	2,334	9,394	21,817	c 34,607
Queensland	1,086	1,360	8,102	7,077	17,625
South Australia a	168	210	2,394	2,670	5,442
Tasmania	110	426	602	3,811	4,949
New Zealand	540	1,759	8,244	11,582	d 22,125
Total, Australasia	5,029	10,672	52,244	79,115	147,060

a Including the Northern Territory. b Including three cases "against person and property." c Inclusive of summons cases.
d Exclusive of 330 Maori convictions, details of which are not available.

Digitized by Google

No. 30.—Superior Courts and Gaols, 1902.

State or Colony.	Superior Courts, 1902.				Gaols and Penal Establishments.
	Cases.	Convictions.	Acquittals.	Cases not settled or not proceeded with.	Prisoners in Confinement on 31st December, 1902.
	No.	No.	No.	No.	No.
Western Australia	285	165	72	48	*f* 535
New South Wales	1,226	775	423	28	1,835
Victoria	708	485	223	...	1,071
Queensland	459	243	121	95	547
South Australia *a*	115	80	35	...	303
Tasmania	40	28	12	...	96
New Zealand	*b c* 449	*b d* 339	*e* 110	...	653
Total, Australasia	3,282	2,115	996	171	5,040

a Including the Northern Territory. *b* Including 23 sent from Magistrate Court for sentence. *c* Including 12 Maoris. *d* Including 5 Maoris. *e* Including 7 Maoris. *f* Including 137 Aborigines, also 30 others not under sentence.

Digitized by Google

IX.—CHARITABLE INSTITUTIONS.

No. 31.—Inmates in Public Charitable Institutions, exclusive of Hospitals, on 31st December, 1902.

State or Colony.	Inmates on 31st December, 1902.		
	Under 15 Years.	15 Years and over.	Total.
	No.	No.	No.
Western Australia ...	446	436	882
New South Wales ...	a	a	6,233
Victoria ...	1,668	3,074	4,742
Queensland ...	a	a	2,396
South Australia b ...	674	1,039	1,713
Tasmania ...	67	387	454
New Zealand ...	234	1,124	1,358
Total, Australasia ...	a	a	17,778

a Information not available. b Including the Northern Territory.

Digitized by Google

X.—EDUCATION.

No. 32.—Schools and Teaching Staffs, 1902.

State or Colony.	Number of Schools.			Number of Teachers in Schools.								
				State.			Private.			Total.		
	State.	Private.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
Western Australia	250	80	330	261	416	677	41	253	294	302	669	971
New South Wales	2,846	879	3,725	2,988	2,413	5,401	589	2,806	3,395	3,577	5,219	8,796
Victoria *a*	2,041	872	2,913	1,917	3,149	5,066	404	1,975	2,379	2,321	5,124	7,445
Queensland	1,008	190	1,198	1,143	1,247	2,390	129	641	770	1,272	1,888	3,160
South Australia *b*	718	230	948	411	942	1,353	188	493	681	599	1,435	2,034
Tasmania	349	197	546	232	446	678	*c*	*c*	*c*	*d* 232	*d* 446	*d* 678
New Zealand	1,708	322	2,030	1,415	2,289	3,704	*c*	*c*	1,009	*c*	*c*	4,713
Total, Australasia ...	8,920	2,770	11,690	8,367	10,902	19,269	*c*	*c*	*d* 8,528	*c*	*c*	*d* 27,797

Digitized by Google

No. 33.—Scholars, Enrolment, and Average Attendance, 1902.

State or Colony.	Net Enrolment of Scholars.									Average Attendance during Year. *k*		
	In State Schools.			In Private Schools.			In all Schools.					
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	State Schools.	Private Schools.	All Schools.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Western Australia ...	*a* 11,917	*a* 10,848	*a* 22,765	*a* 2,691	*a* 3,569	*a* 6,260	*a* 14,608	*a* 14,417	*a* 29,025	18,448	4,922	23,370
New South Wales ...	112,509	100,339	212,848	26,932	33,212	60,144	139,441	133,551	272,992	*b* 153,659	*h* 60,144	213,803
Victoria *i*	*c*	*c*	228,241	*c*	*c*	43,182	*c*	*c*	271,423	150,939	*h* 43,182	194,121
Queensland	46,533	42,998	89,531	*d* 6,841	*d* 9,227	*d* 16,068	53,374	52,225	105,599	72,809	13,728	86,537
South Australia *e* ...	*c*	*c*	63,043	4,502	4,923	9,425	*c*	*c*	72,468	43,546	*h* 9,425	52,971
Tasmania	*j* 10,458	*j* 9,098	*j* 19,556	*d* 4,428	*d* 5,535	*d* 9,963	14,886	14,633	29,519	14,541	*d* 9,963	24,504
New Zealand	*f* 69,742	*f* 64,210	*f* 133,952	*c*	*c*	*g* 16,378	*c*	*c*	150,330	*f* 133,952	16,378	150,330
Total, Australasia...	*c*	*c*	769,936	*c*	*c*	161,420	*c*	*c*	931,356	587,894	157,742	745,636

a Enrolment last school day of 1902. *b* Last quarter of the year. *c* Information not available. *d* Gross enrolment. *e* Including the Northern Territory. *f* Average weekly roll numbers. *g* Average attendance. *h* Net enrolment. *i* Year ended 30th June, 1902. *j* Average monthly roll numbers. *k* In using the figures given under this heading, special reference should be made to the preceding footnotes.

Digitized by Google

X.—EDUCATION.

No. 32.—Schools and Teaching Staffs, 1902.

State or Colony.	Number of Schools.			Number of Teachers in Schools.								
				State.			Private.			Total.		
	State.	Private.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
Western Australia	250	80	330	261	416	677	41	253	294	302	669	971
New South Wales	2,846	879	3,725	2,988	2,413	5,401	589	2,806	3,395	3,577	5,219	8,796
Victoria *a*	2,041	872	2,913	1,917	3,149	5,066	404	1,975	2,379	2,321	5,124	7,445
Queensland	1,008	190	1,198	1,143	1,247	2,390	129	641	770	1,272	1,888	3,160
South Australia *b*	718	230	948	411	942	1,353	188	493	681	599	1,435	2,034
Tasmania	349	197	546	232	446	678	*c*	*c*	*c*	*d* 232	*d* 446	*d* 678
New Zealand	1,708	322	2,030	1,415	2,289	3,704	*c*	*c*	1,009	*c*	*c*	4,713
Total, Australasia ...	8,920	2,770	11,690	8,367	10,902	19,269	*c*	*c*	*d* 8,528	*c*	*c*	*d* 27,797

Digitized by Google

No. 33.—Scholars, Enrolment, and Average Attendance, 1902.

State or Colony.	Net Enrolment of Scholars.									Average Attendance during Year. k		
	In State Schools.			In Private Schools.			In all Schools.					
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	State Schools.	Private Schools.	All Schools.
	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.	No.
Western Australia ...	a 11,917	a 10,848	a 22,765	a 2,691	a 3,569	a 6,260	a 14,608	a 14,417	a 29,025	18,448	4,922	23,370
New South Wales ...	112,509	100,339	212,848	26,932	33,212	60,144	139,441	133,551	272,992	b 153,659	h 60,144	213,803
Victoria i	c	c	228,241	c	c	43,182	c	c	271,423	150,939	h 43,182	194,121
Queensland	46,533	42,998	89,531	d 6,841	d 9,227	d 16,068	53,374	52,225	105,599	72,809	13,728	86,537
South Australia e ...	c	c	63,043	4,502	4,923	9,425	c	c	72,468	43,546	h 9,425	52,971
Tasmania	j 10,458	j 9,098	j 19,556	d 4,428	d 5,535	d 9,963	14,886	14,633	29,519	14,541	d 9,963	24,504
New Zealand	f 69,742	f 64,210	f 133,952	c	c	g 16,378	c	c	150,330	f 133,952	16,378	150,330
Total, Australasia...	c	c	769,936	c	c	161,420	c	c	931,356	587,894	157,742	745,636

a Enrolment last school day of 1902. b Last quarter of the year. c Information not available. d Gross enrolment. e Including the Northern Territory. f Average weekly roll numbers. g Average attendance. h Net enrolment. i Year ended 30th June, 1902. j Average monthly roll numbers. k In using the figures given under this heading, special reference should be made to the preceding footnotes.

Digitized by Google

No. 34.—Cost of Instruction, 1902.

State or Colony.	Government.					Parents.		
	Maintenance.	Rent.	Buildings. Revenue.	Buildings. Loan.	Total.	Fees received by State.	Fees retained by Teachers.	Total Fees.
	£	£	£	£	£	£	£	£
Western Australia	108,927	270	32,218	...	141,415	*a* 680	...	680
New South Wales	738,090	1,352	35,441	40,000	814,883	85,230	...	85,230
Victoria *b*	688,961	4,118	42,629	35,189	770,897	...	6,480	6,480
Queensland	261,317	...	9,443	...	270,760	...	...	...
South Australia *c*	149,812	11,250	4,062	14,520	179,653	1,073	...	1,073
Tasmania	57,948	324	2,291	...	60,563	12,232	179	12,411
New Zealand	464,084	...	61,763		525,847	...	...	...
Total, Australasia ..	2,469,139	17,314	277,565		2,764,018	99,215	6,659	105,874

Digitized by Google

.I.—COMMONWEALTH POPULATION AND PUBLIC DEBT, 1903.

35.—Estimated Population of the several States of the Commonwealth on 30th June, 1903.

State.	Estimated Population on 30th June, 1903.					
	Males.		Females.		Total.	
	Number.	Percentage on total male population of Commonwealth.	Number.	Percentage on total female population of Commonwealth.	Number.	Percentage on total population of Commonwealth.
		%		%		%
rn Australia ..	135,479	6·64	88,832	4·77	224,311	5·75
outh Wales .	746,280	36·56	671,590	36·10	1,417,870	36·34
ia	600,843	29·44	604,492	32·49	1,205,335	30·89
sland	283,795	13·90	228,965	12·31	512,760	13·14
Australia *a* ..	184,520	9·04	179,884	9·67	364,404	9·34
nia	90,160	4·42	86,800	4·66	176,960	4·54
.l, Commonwealth	2,041,077	100·00	1,860,563	100·00	3,901,640	100·00

a Including the Northern Territory.

36.—Estimated Adult Population of the several States of the Commonwealth on 30th June, 1903.

State.	Estimated Adult Population on 30th June, 1903.					
	Males.		Females.		Total.	
	Number.	Percentage on total adult male population of Commonwealth.	Number.	Percentage on total adult female population of Commonwealth.	Number.	Percentage on total adult population of Commonwealth.
		%		%		%
rn Australia ...	92,302	8·26	46,992	4·96	139,294	6·75
outh Wales ...	398,961	35·72	333,041	35·16	732,002	35·46
ia	325,477	29·14	326,788	34·50	652,265	31·60
sland	158,358	14·18	106,881	11·29	265,239	12·85
Australia *a* ...	95,637	8·56	91,129	9·62	186,766	9·05
nia	46,180	4·14	42,350	4·47	88,530	4·29
al, Commonwealth	1,116,915	100·00	947,181	100·00	2,064,096	100·00

a Including the Northern Territory.

Digitized by Google

No. 37.—Public Debts of the several States of the C
wealth on 30th June, 1903.

State.	Public Debt on 30th June, 1903.									
	Amount.	Per head of estimated total population.			Per head of estimated adult population.			P estim p
	£	£	s.	d.	£	s.	d.	
Western Australia ...	15,627,298	69	13	4	112	3	9	
New South Wales ...	77,692,987	54	15	11	106	2	9	
Victoria	51,447,900	42	13	8	78	17	6	
Queensland	40,531,247	79	0	11	152	16	2	
South Australia *a* ...	27,828,370	76	7	4	149	0	0	
Tasmania	9,219,993	52	2	1	104	2	11	
Total, Commonwealth	222,347,795	56	19	9	107	14	5	

a Including the Northern Territory.

Digitized by Google

Legislative Assembly of Western Australia (6th October, 1903).

C.—THE FINANCIAL STATEMENT FOR THE YEAR 1903–1904.

By the Hon. JAMES GARDINER, M.L.A. (Colonial Treasurer).

The Past Year, 1902-3.

LAST year when I delivered the Budget speech, I said I felt justified in letting a tone of absolute hopefulness and trust in the future of this State permeate the whole of my utterances. Looking back upon the financial year just closed, I think it will be admitted that the anticipations which I then made were fully realised; in other words, a full measure of prosperity, pressed down and running over, was the portion of this State for last year. We stand facing a new year, and, so far as human foresight can predict, it contains a rich, full promise of that steady and solid prosperity which comes from the expansion of industry and development of undoubted resources. The outlook for these great resources, represented as they are by products which have a world's market—gold, copper, tin, iron, timber, pearl, wool, corn, wine, meat, and fruit—was never in the history of this State so hopeful as at the present time. And there is opened to us, as a result, a vista of that sound, healthy prosperity, the outcome of internal development and production, rather than the inflated and consequently transient prosperity engendered by huge borrowing. To conserve this position will be the aim of the present Government; for they recognise that in so doing they have with them and behind them the careful and matured thought of all who wish the prosperity of this State to be solid and lasting. Last year it was my regrettable duty, on behalf of this State, to sympathise with our sister States on the disastrous effect of the great drought. Knowing, as this State always has known, the benefit of a splendid rainfall and its material effect on prosperity, may I be permitted on behalf of this State to rejoice with the other States on the termination of the great drought, and the prospect which is before them of a season which bids fair to be a record for

Digitized by Google

Australia. Following the custom which I introduced last year, and of which members were at that time good enough to express approval, I have personally prepared a set of returns for the guidance of the Committee, giving in a concrete and business-like form all the information which I think not only members of this House and the people of this State, but also those who are interested in our finances, will require. Although these returns are in a concrete form, I have balanced them with the more elaborate returns prepared by the Treasury; so that members can clearly see that the totals of them are absolutely correct.

Revenue Estimated and Received.

If members will turn to Return No. 1, they will see that the

Return No. 1.

RECEIPTS—1902-3.

	£	s.	d.	£	s.	d.
The Treasurer's estimate for year ended 30th June, 1903, was ...	3,647,364	0	0			
The actual amount received was ...	3,630,237	11	7			
Or a total Net Over-estimate of ...	...			17,126	8	5
The *Over-estimates were*—						
Net Commonwealth Revenue ...	31,882	13	9			
Mining Revenue	3,409	15	7			
Fines, Forfeitures, and Fees of Court	1,714	3	4			
Reimbursements in Aid ...	16,004	8	5			
Railway Receipts	4,188	2	10			
Water Receipts	29,952	5	4			
Stamp Revenue	1,500	5	6			
				88,651	14	9
The *Under-estimates were*—						
Harbour Dues	18,158	8	11			
Land Revenue	1,658	11	0			
Licenses	1,187	11	6			
Fees of Public Office	2,213	14	6			
Rottnest Establishment ...	952	8	10			
Tramway Receipts	711	7	9			
Educational Receipts	261	19	3			
Miscellaneous Receipts... ...	12,621	9	9			
Interest	652	8	8			
Companies Duty Tax	33,107	6	2			
				71,525	6	4
Total Net Over-estimate ...	...			£17,126	8	5

Treasurer's estimate of receipts for the year ended the 30th June, 1903, was £3,647,364, while the actual amount received was

Digitized by Google

£3,630,237 11s. 7d. In preparing my estimates of the revenue I went carefully into the subject, and tried to get as close as possible to what I conceived would be the actual result; for I venture to say that, in estimating our revenue, it is always advisable for a Treasurer to get as closely as he can to actual revenue; otherwise, if he for the sake of personal *kudos* prefers to show a big surplus at the end of the year, he runs a great risk of dislocating the whole of his financial arrangements owing to an unworthy estimate. I therefore estimated my net revenue at £3,647,364, and actually received within £17,126 8s. 5d. of that sum. And when we consider that there was a sum of nearly £10,000 held in suspense by the Commonwealth under Section 95 of the Commonwealth Act, which sum, had I received it, would have reduced that amount to £7,126, I think the Committee will admit that I have every reason to be satisfied with the first estimate which I made as Treasurer of this State. The over-estimates included net Commonwealth revenue, £31,882 13s. 9d. My estimate was above that of the Commonwealth Treasurer; but with the £10,000 to which I have just referred, it would have been only £21,000 short. The mining revenue was £3,409—I omit the shillings and pence as usual—fines, forfeitures, and fees of court £1,714; reimbursements-in-aid £16,004, and reimbursements-in-aid are but a bookkeeping entry between the departments. Last year for the first time we charged up printing to the various departments, and this vote was extremely hard to estimate. Railway receipts £4,188: when I say that the estimate of the railway Revenue was £1,600,000, and I was only £4,188 out in that estimate, I think members will admit it was a very keen one indeed. Water receipts were £29,952 short—this was due to the fact that when we were estimating these receipts we were extremely doubtful whether we would be able to fulfil the promise made to this House that the great water scheme would be completed in January. Had it not been completed until the end of the financial year, then the whole of the expense would have been debited up to the work, and we would have received, as then anticipated, a gross revenue from water; but owing to the great energy introduced into the working of the scheme by the Minister for Works and his officers we were enabled to complete the work on 26th January, and consequently from that date instead of my revenue being gross it was absolutely net; whilst I must admit some disappointment that I did not come closer to the estimate, I am sure, on the result the country, has every reason to be congratulated. The under-estimates were: harbour dues £18,158, land revenue £1,658, licenses £1,187, fees of public office £2,213, Rottnest establishment £952, tramway receipts £711, educational receipts £261, miscellaneous receipts £12,621, interest £652, and companies duty tax £33,107. The harbour dues and miscellaneous receipts were both the effect of a transference of departments: the harbour trust took over from the railways the control of the Fremantle Harbour earlier than it was thought they would, and the railway department took over the control of the Menzies to Leonora Railway later than we thought

they would, so that these two actions had a material effect or estimates so far as these particular items are concerned. Or under-estimates the principal item is companies' duty tax £33 In making my estimate I had only before me the most me particulars of how this tax had been evaded. When I went into the matter and took very stringent measures for its collec I found my revenue would be considerably exceeded, and event it exceeded my estimate by no less a sum than £33,107. Whi may in these figures lose my reputation as a prophet, I thi shall be entitled to some small praise as an administrator. I t the Committee will agree with me that so far as my estimates o receipts are concerned, I was remarkably fortunate in estima them as closely as I did, considering the amount invo aggregated nearly four millions of money, and they were £17,126 out. All I can say is that I sincerely hope the estim which I am making for the forthcoming year will be as ne accurate as those were.

Expenditure for the past Year, a Surplus.

Turning to the expenditure,

EXPENDITURE—1902-3.

	£	s
The Treasurer's Estimate of Expenditure for the year was	3,761,113	
The Actual Expenditure was	3,521,762	1
Or an Over-estimate of Expenditure of	£239,350	1

The Over-estimate were—	£	s.	d.		
Special Acts	10,309	4	10		
His Excellency the Governor ...	385	17	6		
Legislative Council	1,485	0	1		
Legislative Assembly	1,127	18	5		
Attorney General	4,601	14	11		
Colonial Secretary and Minister for Education	6,018	6	9		
Minister for Works	157,966	4	3		
Railways and Tramways	47,601	17	8		
Minister for Lands	3,304	3	4		
Minister for Mines	5,527	18	2		
Colonial Treasurer	1,033	9	0		
				239,361	14
The Under-estimates was—					
Executive Council				10	18
Total Net Over-estimate				£239,350	16

the Treasurer's estimate of expenditure for the year was £3,761,1 6s. 2d., and the actual expenditure was £3,521,762 10s. 1d., or

Digitized by Google

over-estimate of the expenditure of £239,350 16s. 1d. The over-estimates were: Special Acts £10,309, His Excellency the Governor £385, Legislative Council £1,485, Legislative Assembly £1,127, Attorney General £4,601, Colonial Secretary and Minister for Education £6,018, Minister for Works £157,966, Railways and Tramways £47,601, Minister for Lands £3,304, Minister for Mines £5,527, Colonial Treasurer £1,033; or a total amount as over-estimates of the expenditure of £239,361 14s. 11d. With the exception of £157,966 represented by an under-expenditure on public works, the balance can be fairly claimed as representing savings in administration. In the Railways there was a saving of £47,601; this result was materially influenced by the summer rains. which enabled a marked saving to be effected on the cost of the water used by the railways. With regard to the other estimates of public works, the Government have been blamed, and blamed without stint, for not spending every penny, and even more than the estimate for the year of £519,162; but when I say that under any circumstances we were entitled to earn the money before we spent it, and the June proportion of that sum would have been roughly £43,000, and as there were works in progress and liabilities entered into on account of the works authorised amounting to £175,000, or £18,000 more than the authorisations, it can be easily seen there was no disposition to curtail expenditure on public works for the purpose of showing a fictitious surplus. In the return of expenditure for 1903 the under-estimates total only £10 18s. 10d. If members will turn back to the year 1901-2 they will find that the under-estimates of expenditure totalled £127,023 16s.; this year they only total £10 18s. 10d., which will have a material effect upon the Excess Bill to be presented to Parliament. There is a balancing return at the foot which shows how we arrive at our surplus.

Over-estimate of Expenditure	£239,350	16	1
Under-estimate of Revenue	17,126	8	5
	£222,224	7	8
Surplus estimated to be in hand at end of year	9,435	5	0
Actual Surplus on 30th June, 1903...	£231,659	12	8

The over-estimate of expenditure was £239,350 16s. 1d., under-estimate of revenue £17,126 8s. 5d., or a total surplus of £222,224 7s. 8d. We estimated the surplus at the end of last year at £9,435 5s.; if we add that we shall find the total agrees with the actual

Digitized by Google

surplus on the 30th June last of £231,659 12s. 8d. The actual position of the consolidated revenue is also shown : Revenue

CONSOLIDATED REVENUE.

Revenue	£3,630,237	11	7
Expenditure	3,521,762	10	1
Surplus on Year	108,475	1	6
Add Balance from previous year	123,184	11	2
Surplus as above	£231,659	12	8

£3,630,237 11s. 7d., expenditure £3,521,762 10s. 1d., the surplus on the year £108,475 1s. 6d. If we add the balance from the previous year of £123,184 11s. 2d., it will be found that balances to the surplus already mentioned of £231,659 12s. 8d.

The State Balance-sheet.

If members will turn to Return No. 2 they will see a synopsis of the State balance-sheet is given to the 30th June, 1903. On the

Return No. 2.

SYNOPSIS OF BALANCE-SHEET FOR 30TH JUNE, 1903.

DR.	£	s.	d.	£	s.	d.
Balance on year	231,659	12	8			
Sinking Fund	655,069	3	11			
General Loan Fund	103,332	17	11			
Trust and Deposit Accounts	661,425	16	7			
Savings Bank	1,990,862	15	11			
				3,642,350	7	0
CR.						
Advances to be recovered	95,180	0	5			
Investments and Sinking Fund ...	2,634,215	8	10			
Stores on hand	265,905	11	6			
Cash in hand—						
State Savings Bank	276,214	4	6			
Treasury	1,204	11	5			
Agricultural Bank Advance Account and Sinking Fund Account ...	2,091	18	7			
Current Accounts	22,797	4	2			
Trust Accounts, Fixed Deposits ...	31,120	14	8			
Eastern States	2,987	3	0			
London	1,161	2	2			
Remittances *in transitu*	309,472	7	9			
				3,642,350	7	0

Digitized by Google

debit side we have the balance on the year of £231,659 12s. 8d.; Sinking fund, £655,069 3s. 11d.; General Loan Fund, £103,332 17s. 11d.; Trust and deposit accounts, £661,425 16s. 7d., and the Savings Bank £1,990,862 15s. 11d., or a total of £3,642,350 7s. The trust and deposit accounts include all sums lodged by insurance and assurance companies, suspense accounts, and roads boards accounts; and referring to the Savings Bank deposits, £1,990,862, members will see this sum is nearly £100,000 increase on the sum standing to the credit of the Savings Bank deposits last year. Turning to the credit side the advances to be recovered amount to £95,180; investments and sinking fund, £2,634,215 8s. 10d.; stores in hand, £265,905 11s. 6d.; cash in hand State Savings Bank £276,214 4s. 6d., in the Treasury £1,204 11s. 5d; Agricultural Bank advance account and sinking fund, £2,091 18s. 7d.; current accounts, £22,797 4s. 2d.; trust accounts, fixed deposits, £31,120 14s. 8d.; in the Eastern States, £2,987 3s.; in London, £1,161 2s. 2d.; remittances *in transitu*, £309,472 7s. 9d. The advances to be recovered include services performed for other States and other countries, also the balance of interest held on account of the London bondholders and the Savings Bank. Investment and sinking fund contain securities for all investments including Savings Bank £1,703,202, sinking fund £655,069, life assurance £165,380, municipal loans £54,057, and with other small amounts make up the total.

Stores Account, how adjusted

Stores in hand represent £265,905 11s. 6d. The Committee will note with satisfaction that whilst last year this amount stood in the State's balance-sheet at no less a sum than £605,198, it now stands at £265,905, or a reduction during the year of £339,293. During the year every effort was made not only to reduce the stock, but to have it placed on a proper mercantile basis. On last year's Estimates I provided a sum of £60,000, which practically amounted to 10 per cent. on the capital value, in order to provide for depreciation and obsolete stock. When we came to take that stock—and I may say that if the details could be put before this House, probably some members would feel rather amused—we found it was absolutely necessary to retake the stock in order to arrive at a correct basis of what stock we really had on hand. We had this done, and as a result of putting it on a business basis, that is making allowances for depreciation and appreciation, in other words giving to that stock a present-day market value, we found it was necessary to roughly write off 13 per cent. or £35,000; so that instead of the £60,000 we anticipated last year we would have to write off, we found it necessary to write off only £35,000. That stock is now in good order, it is systematically and well kept, and I can assure this House that the sum which it represents upon the State balance-sheet would be a realisable asset to-morrow if necessity occurred.

Digitized by Google

Savings Bank Account, etc.

The State Savings Bank has got to its credit £287,652, and £11,445 17s. 6d. of that is interest in suspense at present, which is to be credited to the depositors' accounts; so that the actual cash to the credit of the Savings Bank is £276,214 4s. 6d. Last year it stood at £445,432, but as it was absolutely necessary to earn interest in order that we should pay to depositors 3 per cent. interest on their deposits, £200,000 of that sum was invested in State bonds at 3½ per cent. The Treasury credit of £1,204 11s. 5d. is merely the cash adjustment on the 30th June. The current accounts, £22,797 4s. 2d., are the balances at the banks on that date. The trust accounts and fixed deposits, £31,120 14s. 8d., represent contractors' and other deposits held by the State. The remittances *in transitu*, representing the necessary remittances to London to provide funds to meet obligations there, were £309,472 7s. 9d. That is a full explanation of Return No. 2.

Loans and Indebtedness.

Now we come to Return No. 3, a statement of loans as on the 30th June, 1903. The total authorisations on the 30th June, 1902, were

Return No. 3.

STATEMENTS OF LOANS AS ON 30TH JUNE, 1903.

	£	s.	d.	£	s.	d.
Total Authorisations 30th June, 1902	15,940,929	11	3			
Conversion Expenses provided for in Act, and for which Stock was issued during year	323	16	0			
Total Authorisations 30th June, 1903	...			15,941,253	7	3
Yet to be raised	2,190,000	0	0			
Of this sum Savings Bank, Municipalities, and Local Inscribed Stock absorb	2,056,445	0	0			
Balance available for flotation ...	133,555	0	0			
Loans floated to 30th June, 1902 ...	15,085,309	11	3			
Loans floated locally during the year	722,065	0	0			
Loans floated by Crown Agents during the year	323	16	0			
Balance available for flotation as above	133,555	0	0			
				15,941,253	7	3

£15,940,929 11s. 3d. The conversion expenses provided for in the Act (which means the Act providing that our stock could be con-

Digitized by Google

verted into a standard stock), and for which stock was issued during the year, were £328 16s.; showing that the total authorisations on the 30th June, 1903, were £15,941,253 7s. 3d. There is yet to be raised a sum of £2,190,000. Of this sum the Savings Bank, the municipalities, and the local inscribed stock absorbed £2,056,445, leaving a balance available for flotation on the 30th June last of £133,555. The loans floated to 30th June, 1902, amounted to £15,085,309 11s. 3d. The loans floated locally during the year amounted to £722,065. The loans floated by Crown Agents during the year were £323 16s., and the balance available for flotation as above was £133,555. We floated during the year £722,389; but by sinking fund and redemption we paid off no less a sum than £205,731. So, whilst we borrowed £722,389, and of that sum we had in hand to start the present financial year £103,332, we only increased the indebtedness by £516,658. Our actual loan indebtedness is also shown on Return No. 3. The total

ACTUAL LOAN INDEBTEDNESS.

	£	s.	d.	£	s.	d.
Total amount raised	15,807,698	7	3			
Total yet to raise	133,555	0	0			
Total authorisations as above...	...			15,941,253	7	3
Less accumulated Sinking Fund ...	655,069	3	11			
And redeemed Debentures, included in authorisations	180,400	0	0			
				835,469	3	11
Our Total Indebtedness, when all existing authorisations are raised, will be	...			£15,105,784	3	4

amount raised was £15,807,698 7s. 3d.; the total yet to raise is £133,555, showing the balance of the total authorisations £15,941,253 7s. 3d., less accumulated sinking fund and redeemed debentures included in authorisations £835,469 3s. 11d., or a total to the credit of the redemption of our stock—I want this to go right into the minds of hon. members, that this State had provided up to the 30th June last no less a sum than £835,469 3s. 11d.; so that our indebtedness when the existing authorisations are raised, instead of being £15,941,253 7s. 3d., will be £15,105,784 3s. 4d., or an indebtedness on our present population at the rate of £66 10s. 11d. per head, as against £69 7s. 10d. on the 30th June, 1902, showing an improvement in this respect of no less a sum than £2 16s. 11d. per head. If members will refer to the comparative return of last year, they will see that our indebtedness would

Digitized by Google

unless we had provided for sinking fund, have been no less than £15,311,190, but that by providing a sinking fund it is now reduced to £15,105,784 3s. 4d.

Loan Moneys, how Expended.

Return No. 4 shows very clearly the manner in which we have spent our borrowed money, and I venture to say without the slightest fear of contradiction that no State in the Commonwealth can show such a return of prudent expenditure as is embodied in the return I am now placing before the Committee.

Return No. 4.

HOW LOANS EXPENDED UP TO 30TH JUNE, 1903.

		Total Flotations as charged to Public Works.			Actual cash spent.		
		£	s.	d.	£	s.	d.
Railways and Tramways		8,905,868	0	7	8,607,368	3	6
Electric Telegraphs		276,721	7	0	269,307	13	5
Harbour and River Improvements ...		2,128,118	3	1	1,973,633	5	11
Public Buildings		65,798	10	8	63,876	4	8
Water Supply and Sewerage ...		2,971,803	4	11	2,742,798	17	6
Development of Goldfields and Mineral Resources...		838,196	7	7	823,532	19	7
Roads and Bridges		143,424	9	9	142,537	14	11
Development of Agriculture ...		385,528	7	9	382,823	14	8
Immigration		28,854	11	3	28,625	12	4
Miscellaneous...		63,385	4	8	63,351	19	11
Cost of Raising	£606,509 2 11				15,097,856	6	5
Unexpended Balance	103,332 17 11				709,842	0	10
		£15,807,698	7	3	£15,807,698	7	3

We had practically expended upon public works up to the 30th June, 1903, £15,807,698 7s. 3d. Of that sum we had spent on railways and tramways £8,905,868 0s. 7d., on electric telegraphs £276,721 7s., on harbour and river improvements £2,128,118 3s. 1d., on public buildings £65,798 10s. 8d., on water supply and sewerage £2,971,803 4s. 11d., on development of goldfields and mineral resources £838,196 7s. 7d., on roads and bridges £143,424 9s. 9d., on development of agriculture (including £300,000 for part of

Digitized by Google

purchase of land on the Great Southern Railway) £385,528 7s. 9d., on immigration (which this year is not on the loan estimates but on revenue estimates) £28,854 11s. 3d., and on miscellaneous £63,385 4s. 8d. It will be seen that in the allocation of the amounts to each work the cost of raising the loan has been included. If members will next look at Return No. 5, they will see that whilst the previous return shows the actual allocations up to the 30th June last, Return 5 gives the actual indebtedness of loan works to the same date.

Return No. 5.

ACTUAL INDEBTEDNESS OF LOAN WORKS ON 30TH JUNE, 1903.

	£	s.	d.	£	s.	d.
Railways and Tramways	8,787,721	10	7			
Telegraphs	245,786	17	9			
Harbour and River Improvements ...	2,108,776	2	4			
Public Buildings	63,131	6	8			
Water Supply and Sewerage ...	2,971,617	12	3			
Development of Goldfields and Mineral Resources	838,196	7	7			
Roads and Bridges	134,307	5	8			
Development of Agriculture ...	385,528	7	9			
Immigration	28,854	11	3			
Miscellaneous	63,378	5	5			
				15,627,298	7	3
Actual Indebtedness...	15,627,298	7	3			
Debentures Redeemed	180,400	0	0			
Balancing to Total Flotations ...	£15,807,698	7	3			

Members will find that there is a difference of £180,400. The actual indebtedness of loan works on the 30th June last amounted to £15,627,298 7s. 3d. The reason of the difference is that we have redeemed from that authorisation £180,400; and the proportionate amount being now credited to the capital cost of each of these works accounts for the reduction which appears as between the totals on Return 4 and Return 5. As I shall have to use Return 4 very largely at a later period when contrasting the finances and the financial methods of Western Australia as separate from the finances and the financial methods of Australia, I will not make farther comment at the present time. The old year and its finances fortunately closes everything, and we can only use it to the extent of letting it affect our judgment in estimating our revenue and expenditure for the current year; consequently the

year before us will have all the interest so far as this House and this State are concerned, and we are naturally more interested in its anticipations and its operations than we are in the lessons we derive from the past year.

Return No. 6.

ESTIMATED REVENUE FOR YEAR ENDING 30TH JUNE, 1904.

	1902-3.			1903-4.		
	£	s.	d.	£	s.	d.
Commonwealth	1,255,731	6	3	1,135,000	0	0
Harbour Dues	42,158	8	11	54,000	0	0
Land Revenue	156,658	11	0	170,000	0	0
Mining Revenue	116,590	4	5	123,000	0	0
Licenses	31,187	11	6	35,000	0	0
Fines, Forfeitures, and Fees of Court	28,285	16	8	35,000	0	0
Fees of Public Offices	29,213	14	6	32,000	0	0
Rottnest Establishment	1,202	8	10	1,000	0	0
Reimbursements in aid	56,995	11	7	61,300	0	0
Railway Receipts	1,595,811	17	2	1,629,000	0	0
Tramway Receipts	2,211	7	9	2,500	0	0
Water Receipts	30,047	14	8	80,700	0	0
Educational Receipts	2,261	19	3	2,700	0	0
Stamp Revenue	53,499	14	6	63,000	0	0
Interest	8,652	8	8	9,000	0	0
Dividend Duties	127,607	6	2	110,000	0	0
Miscellaneous Receipts	92,121	9	9	70,000	0	0
	3,630,237	11	7	3,613,200	0	0
Surplus from 1902-3	...			231,659	12	8
				£3,844,859	12	8

Return 6 gives the estimated revenue for the year ending 30th June, 1904, from the following sources:—Commonwealth £1,135,000, Harbour dues £54,000, Land revenue £170,000, Mining revenue, £123,000, Licenses £35,000, Fines, forfeitures and fees of court £35,000, Fees of public offices £32,000, Rottnest establishment £1,000, Reimbursements-in-aid £61,300, Railway receipts £1,629,000, Tramway receipts £2,500, Water receipts £80,700, Educational receipts £2.700, Stamp revenue £63,000, Interest £9,000, Dividend duties £110,000, Miscellaneous receipts £70,000; or a total estimated revenue for the year ending June next of £3,844,859 12s. 8d., this amount including £231,659 12s. 8d. of surplus from the year 1902-3. There is a comparative column in the return, so that members can see the actual receipts for last year and the anticipated revenue for this, and can form for themselves a fairly accurate judgment of how far the estimates are likely to be

Digitized by Google

realised. It will be seen that I anticipate an increase in most of the items of general revenue. These have been most carefully analysed; and the increases, except in one or two cases, are merely the nominal increases that can be expected. With regard to the Commonwealth revenue I have estimated the net Commonwealth receipts, allowing for a fall in the ordinary customs revenue of £7,000, a fall in respect of the sliding-scale of £41,000, an anticipated increase of expenditure by the Commonwealth of £81,000, or a total of £129,000, and have added an increase of revenue from posts and telegraphs and other receipts of £9,000. Taking these together, it will be seen that I anticipate a fall in the nett revenue of £120,000, which I have shown in the estimates. The next item is Harbour Dues, £54,000. The Fremantle Harbour Trust have made a very careful and business-like estimate of their revenue; and I am quite confident from their estimate that we shall receive the full amount of £54,000. The estimate for the Lands and Mines, while showing an increase which may seem optimistic on a first glance, is justified when we consider the fact that applications for land are simply pouring in, giving every evidence of great expansion not only in settlement but in revenue, and that the Mines excess which is here shown is due entirely to the extra revenue derivable from additional expenditure on public batteries. The smaller items indicate merely the normal growth of those revenue-producing departments which they represent.

Railway Estimates.

Turning to the Railways, the revenue has been carefully estimated by the Commissioner and his officers, and is £33,000 more than last year's receipts. If we compare the quarter just closed with the corresponding quarter of last year, the estimate ought to be £50,000 above last year's revenue; and there is not the slightest doubt, with the prospect of an abundant harvest before us, the extra amount paid by the Commonwealth for the conveyance of mails, and the traffic necessary to the construction of the Malcolm to Laverton railway, that if anything the estimate will be under rather than over the mark. We must not forget that in the estimate of last year, although it totalled £1,600,000, the department was out by the small sum of only £4,188. Included in the water receipts is a sum of £60,000, revenue from the Coolgardie Water Scheme. This is net revenue, because the board who control the scheme charge up all expenses, and pay only the balance into the Treasury; and as the Treasury anticipate receiving £60,000 from that source, we can clearly perceive that the revenue which has been derived from water is the actual and not the gross revenue.

MR. ILLINGWORTH: Less the interest and sinking fund.

THE TREASURER: It is the actual revenue after deducting expenses of administration; and although considerably below the

amount necessary to pay interest and sinking fund, the revenue received does show us that there is every prospect of this scheme eventually fulfilling some, at all events, of the anticipations of those who prophesied that it would be a great success. A large number of mines have entered into an agreement dating from the 1st of last month to do away with salt water and to use absolutely none but fresh; and speaking some little time ago with one of the best known managers on the fields, he assured me that as a result, he was quite confident that the supply which the mines would take would be absolutely double that on which we were basing our estimates; so that we may look forward to a very large increase of receipts from this source, although in estimating we have striven to err on the safe side. The reduction in Miscellaneous Receipts of £22,000 is owing to the fact that the Menzies-Leonora railway, the receipts from which previously came into that account, has been taken over by the working railways branch.

Dividend Duties.

The next item of any importance is that of Dividend Duties. Last year it was the mining companies from which I expected to make a big increase; this year it is the shipping companies. I say here, with every sense of responsibility, that it is nothing short of a grave public scandal that these companies can publish and flaunt in our faces the profits which they are earning; we know that the larger proportion of those profits is being earned in the Western Australian trade; and yet, by every possible device, they seek to evade the payment of a legitimate and just tax to the State from which they are earning the greater portion of those profits. Last year I said of the mining companies, and I say of the shipping companies this year: Make no mistake; the Government in this State are going to see they pay that dividend duty. If they think that by the law's delays they can evade the Act, let me inform them now that I shall ask this House—and I can rely upon this House agreeing at once—to reimpose Section 31 of the principal Act, in order that I may get from these people what the State believes, and what every citizen of the State believes they should pay, that is a just dividend duty tax out of the great profits which they have made from the Western Australian trade. [General applause.] If these companies do pay the tax—and I am certain that they will—then I venture to say that the revenue derivable from dividend duties will be many thousands of pounds more than my estimate for this year. But I am afraid that owing to the law's delays and other obstacles which generally intervene, it is not wise to estimate a great surplus on that score during the present year. I think that when the present financial year closes, the House will find that so far as the estimates of revenue are concerned, I have been as nearly accurate as I was on the last occasion in foreshadowing the revenue.

Digitized by Google

Expenditure estimated for Current Year.

If we take Return No. 7, we shall find the estimated expenditure for the year ending the 30th June, 1904: Expenditure provided by

---

Return No. 7.

ESTIMATED EXPENDITURE FOR THE YEAR ENDING 30TH JUNE, 1904.

	Actual Expenditure, 1902-3.			Estimated Expenditure, 1903-4.		
	£	s.	d.	£	s.	d.
Expenditure provided by Special Acts	762,146	7	7	783,993	6	10
His Excellency the Governor ...	1,568	12	4	1,722	16	6
The Executive Council	120	18	10	110	0	0
The Legislative Council	2,564	19	11	2,693	0	0
The Legislative Assembly	8,767	1	7	9,670	0	0
The Attorney General	69,770	1	9	67,071	1	7
The Colonial Secretary	339,722	2	8	352,130	9	3
The Minister for Education ...	119,304	15	11	136,230	0	0
The Minister for Mines	126,826	15	5	191,755	17	6
The Minister for Lands	121,243	1	8	174,927	13	4
The Minister for Works and Railways	1,703,615	9	8	1,902,847	17	4
The Colonial Treasurer	266,112	2	9	220,195	13	10
	3,521,762	10	1	3,843,347	16	2
Estimated Surplus... ...	...			1,511	16	6
				£3,844,859	12	8

Special Acts £783,993 6s. 10d., His Excellency the Governor £1,722 16s. 6d., the Executive Council £110, the Legislative Council £2,693, the Legislative Assembly £9,670, the Attorney General £67,071 1s. 7d., the Colonial Secretary £352,130 9s. 3d., the Minister for Education £136,230, the Minister for Mines £191,755 17s. 6d., the Minister for Lands £174,927 13s. 4d., the Minister for Works and Railways, £1,902,847 17s. 4d., the Colonial Treasurer £220,195 13s. 10d., or an estimated expenditure of £3,843,347 16s. 2d. which, with an estimated surplus of £1,511 16s. 6d., will bring the grand total up to £3,844,859 12s. 8d. to balance with the estimated revenue. The estimated net expenditure for the year, exclusive of that of the Commonwealth, is £3,843,347 16s. 2d., as against an actual expenditure for last year of £3 10s. 1d. The estimated expenditure of the Commonwe year is £447,138—in administration, £380,059; in b other works, £67,079.

Digitized by Google

Return No. 8.

ESTIMATED EXPENDITURE ON ADMINISTRATION; RECURRING AND REVENUE-PRODUCING EXPENDITU

For Year ending 30th June, 1904.

	£	s.	d.	£
Special Acts.				
His Excellency the Governor, Ministers' Salaries, etc. ...	11,400	0	0	
Aborigines	5,000	0	0	
Auditor General, half-year	400	0	0	
Annuities	400	0	0	
Commissioner of Railways' Salary...	1,500	0	0	
High School	1,000	0	0	
Judges	7,100	0	0	
Judges' Pensions	850	0	0	
Payment of Members	14,000	0	0	
Pensions and Retiring Allowances...	8,750	0	0	
				50,40
General.				
Aborigines	6,500	0	0	
Government House	1,722	16	6	
Executive Council	110	0	0	
Legislative Council	2,693	0	0	
Legislative Assembly	9,670	0	0	
Crown Law Department	5,798	10	0	
Land Titles	9,500	0	0	
Friendly Societies	3,500	0	0	
Patents and Trade Marks	1,895	0	0	
Stipendiary Magistracy	30,262	11	7	
Supreme Court	16,115	0	0	
Colonial Secretary	3,828	8	7	
Charities	8,420	0	0	
Electoral	9,750	0	0	
Fisheries	3,040	0	0	
Gaols	26,884	0	0	
Government Gardens	2,608	2	0	
Harbour and Light	21,335	3	4	
Observatory	3,630	12	0	
Police	129,031	5	0	
Public Health	6,212	0	0	
Registry	6,665	0	0	
Rottnest Establishment	1,163	11	7	
Education	136,230	0	0	
Mines and Mines Water Supply ..	78,265	17	6	
Geological Survey	5,710	0	0	
Explosives	2,680	0	0	
Lands and Surveys	106,720	16	8	
Carried forward	639,941	14	9	50,40

Digitized by Google

ESTIMATED EXPENDITURE ON ADMINISTRATION; ALSO RECURRING AND REVENUE-PRODUCING EXPENDITURE—*continued.*

	£	s.	d.	£	s.	d.
Brought forward ...	639,941	14	9	50,400	0	0
GENERAL—*continued.*						
Agriculture	16,993	10	0			
Agricultural Bank	2,040	0	0			
Rabbits	5,635	0	0			
Stock Department	5,398	6	8			
Woods and Forests	4,240	0	0			
Public Works	46,787	4	0			
Public Buildings, Repairs and Upkeep	37,148	0	0			
Treasury	12,764	13	3			
Audit Department	7,561	0	0			
Compassionate Allowance	737	0	0			
General Stores Department ...	2,472	17	11			
London Agency	4,868	0	0			
Photo-Lithographic	5,991	0	0			
Post Office Savings Bank	9,625	8	4			
Printing	31,438	0	4			
Refunds	2,000	0	0			
Parliamentary Expenses	1,030	0	0			
Grants, etc.	860	0	0			
Royal Commissions	3,150	0	0			
Law Costs	4,008	17	9			
London and Westminster Bank Commission	4,500	0	0			
Incidentals	13,700	0	0			
Mail Boat Subsidy, Geraldton ...	5,500	0	0			
Administration and Recurring Expenditure	...			868,390	13	0
REVENUE-PRODUCING EXPENDITURE.						
Royal Mint	20,000	0	0			
Public Batteries	53,000	0	0			
Railways and Tramways	1,227,082	13	4			
Gwalia Hotel	6,428	16	3	1,306,511	9	7
				£2,225,302	2	7
Add Commonwealth	...			380,059	0	0
Total Administration, including Commonwealth	...			£2,605,361	2	7

Members will now give their attention to the above Return No. 8, and an analysis of the expenditure on administration and

Digitized by Google

on recurring and revenue-producing works; and by a careful co parison with the same estimates presented last year, these will found to exceed last year's estimates by a sum of £40,000. B when I tell the House that items of increase amounting to betwe £110,000 and £120,000 have been added to the present votes, will be seen that very substantial savings have been effected general administration. I shall not weary members by reading tl details of the votes; they are before them, and I will read the tota merely. Special Acts—that is, exclusive of £20,000 appearing in tl revenue-producing expenditure--total £50,400; the general admi istration totals £868,390 13s., and revenue-producing expenditu £1,306,511 9s. 7d., or a total general expenditure on administratio recurring and revenue-producing votes, so far as the State is co cerned, of £2,255,302 2s. 7d., and if to this we add the Commo wealth expenditure of £380,059 we shall see that the total fo administration, including that of the Commonwealth, is £2,605,36 2s. 7d.

Increases in Expenditure.

The principal increases in administrative expenditure are in th Lands Department, where over £48,000 is provided in excess of th estimates for last year. For years past it has been a known fac that this department has been practically starved. Each Ministe who has sat in the chair of the Commissioner of Crown Lands ha complained of this fact; and as usual, whilst a great deal o advertisement has been given to previous Commissioners of Lands it rests with the present Government to provide sufficient funds t bring the department right up to date. I can assure members tha we are sorry to add this expenditure to the particular department but every member of the House will recognise that if we are to tak full advantage of the position we have been striving for some tim to attain, namely that of inducing settlement on our lands no only from the Eastern States but from the old world, the least w can possibly do is to give every practical assistance to this depart ment to have its work right up to date, so that anyone coming her to select land will not have to put up with the experiences an delays we have had in the past. It has been found absolutel necessary to put on some 60 draughtsmen, computers, and surveyors and in addition it has been necessary to add a large sum to th expenditure in order to bring surveys right up to date, so that whe a man wants to know where to select land, the Lands Office will b able to tell him, and the man will not have to wander about aim lessly, ultimately finding he is on some other man's land. Th greatest opportunity exists so far as this State is concerned fo encouraging settlement on our lands. Let us on our part show no disinclination to give every possible facility to bring about tha highly desirable end. The sum of £16,000 more has been given t the Minister for Mines than on the last estimate, principally for th

Digitized by Google

payment of wages, etcetera. That is necessary for the future extension of the public battery system, but a large portion of this expenditure will come back to us in additional revenue. Then £12,000 is the increase in the administration vote of the Education Department. Both Houses of the State desire that our children shall have every facility to be educated; consequently the expenditure is only increased in proportion to the demands of the State in this particular direction. Then £20,000 more than last year is set down for the administration of Commonwealth departments: this amount includes the proportionate cost of the Commonwealth administration. There is also £5,500 subsidy to the Geraldton steamboat service, and £6,428 for the expenses and purchase of stock for the Gwalia Hotel, which will come back to us as a credit to the revenue. These items total in themselves nearly £110,000, and in addition provision is made on the Estimates for an increase in the salaries of civil servants, a promise which I believe has been made by past Governments. Apparently the mission of this Government is to do nothing but redeem the promises of other Governments, and in this particular respect the Government will endeavour to redeem these promises. The Estimates will show advances in salaries; and advances which, so far as the Government are concerned, we think are justly due, have been given to the civil servants. The principal decreases are in the Works Department, the salaries of the Mines Department, the Treasury Department and Treasury miscellaneous, and the Railways.

Revenue-producing Expenditure.

Now we come to the revenue-producing expenditure, and that includes the Royal Mint £20,000. This will return to the revenue £9,590 more than the expenditure. Then we come to Public Batteries, and the aim of these public conveniences is to benefit the small prospectors, and that will be served by the erection of these batteries and the expenditure upon them; and in addition to that, it will return as revenue to the State over and above all expenses a sum roughly estimated at £5,000. In the Railways, if the anticipated revenue is received and if the expenditure is kept within the figures mentioned, after providing £72,787 in addition to the £1,227,028 13s. 4d, which appears on the document before members, the railways will return a surplus sufficient to pay full interest on capital invested, and will, in addition, make some provision for the reduction of rates foreshadowed by the Premier in speaking on the Address-in-reply. When considering this return this fact should be borne in mind, that so far as we are concerned we are practically expending £1,300,000 to earn £329,000. I am satisfied, judging by the accuracy of the estimates supplied me by the present Commissioner of Railways, that the estimate foreshadowed will be fully realised. The Gwalia Hotel shows a profit roughly of £1,000 over and above the expenditure.

Digitized by Google

General Expenditure, Estimated.

We now turn to the return of general expenditure, and t practically a return which gives back to the citizens of this munity the money we have taken from them in another way.

Return No. 9.

GENERAL EXPENDITURE.

For Year ending 30th June, 1904.

				£	s.	d.	£
Interest on Public Debt				536,911	14	0	
Sinking Fund...				176,681	12	10	
							713,593
PUBLIC WORKS.							
Water Supply				27,150	0	0	
Grants to Roads Boards	£70,000	0	0				
Bridges, Revotes ...	8,363	0	0				
Do. New ...	9,505	0	0				
Roads, Revotes ...	26,670	0	0				
Do. New ...	20,300	0	0				
Total Roads and Bridges Expenditure				134,838	0	0	
Harbour and River, Revotes	£15,950	0	0				
Harbour and River, New	13,220	0	0				
Total Harbour and River Expenditure				29,170	0	0	
Railways.							
Gooseberry Hill ...	£5,000	0	0				
Malcolm to Laverton	70,000	0	0				
Owen's Anchorage...	2,000	0	0				
Jandakot Railway ...	10,000	0	0				
Total Railway Expenditure				87,000	0	0	
Public Works and Buildings.							
William Street Bridge				31,000	0	0	
Court Houses, etc.	£16,235	0	0				
Hospitals	48,475	0	0				
Gaols and Quarters	10,880	0	0				
Industrial Schools ...	235	0	0				
Police Stations ...	21,780	0	0				
Government House	440	0	0				
Carried forward	£298,045	0	0	309,158	0	0	713,593

Digitized by Google

GENERAL EXPENDITURE—*continued.*

		£	s.	d.	£	s.	d.
Brought forward	£298,045 0 0	309,158	0	0	713,593	6	10
Public Works and Buildings—contd.							
Mint	3,200 0 0						
Schools	45,505 0 0						
Mines	16,140 0 0						
Lands	13,050 0 0						
Treasury	6,635 0 0						
General Buildings ...	29,410 0 0						
		211,985	0	0			
Total Works and Buildings		...			521,143	0	0
Other Public Works.							
Public Batteries		25,000	0	0			
Purchase Copper Ore		15,000	0	0			
Development of Mining		7,000	0	0			
Rabbit-proof Fencing		28,000	0	0			
					75,000	0	0
Railways.							
New Works and Improvements ...		25,000	0	0			
Vacuum Train Pipes to complete Trucks		14,000	0	0			
Replacing Obsolete Rolling-stock ...		33,787	0	0			
					72,787	0	0
Subsidy to Municipalities		...			65,800	0	0
Immigration		...			2,000	0	0
Charitable and other Grants.							
Hospitals, etc.		95,352	6	9			
Charities, In-door and Out-door Relief and Assistance to Orphanages, etc.		23,210	0	0			
Agricultural Societies		4,200	0	0			
Sanitation Grants to Local Boards		2,500	0	0			
Mechanics' Institutes		3,000	0	0			
Marsupial, Wild Dog, etc.		1,700	0	0			
Literary and Scientific		14,150	0	0			
Fire Brigades...		3,000	0	0			
Recreation Reserves		14,300	0	0			
Benevolent Grants		4,710	0	0			
Cemeteries		1,000	0	0			
National Grants		600	0	0			
					167,722	6	9
Total State		...			£1,618,045	13	7
Add Commonwealth ...		...			67,079	0	0
Total General Expenditure in State by State and Commonwealth		...			£1,685,124	13	7

The general expenditure return shows interest and sinking fund, £713,593 6s. 10d.; public works under the control of the Public

Digitized by Google

Works Department, £521,143, and othe
railways, £72,787; subsidies to municipa
tion vote, £2,000; charitable and other gr
a total of general expenditure, so far as
£1,618,045 13s. 7d. If we add the Comm
£67,079, that brings the total general e
and by the State and the Commonwealth
Turning again to this return it will be see
on public debt amounting to £536,911
£176,681 12s. 10d., or a total of £713,593
Water supply £27,150, including stock r
cultural areas. Grants to Roads Board
£9,000 on the last year), and a total of ex
and roads and bridges of £134,838. T
and rivers £29,170. Now we come to t
Hill railway, £5,000; Malcolm to Lav
Anchorage railway, £2,000; Jandakot ra
this means is that whilst other States are
diture of loan moneys on works, the St
is continuing the policy which we practi
spending no less a sum than £87,000 out
and directly reproductive works. Public
William Street bridge, £31,000; court h
hospitals, £48,475 (including £26,000
insane); gaols and quarters, £10,880 (i
Fremantle prison); industrial schools,
£21,780; Government House, £440; th
(including Technical and Secondary sc
(including £7,000 for the Woodman's Poi
Lands (including £10,000 for abattoirs in
goldfields), £13,050; Treasury, £6,635; ge
£9,000 for building and converting pub
expenditure on Parliament Houses), £29,
on buildings (exclusive of William Stre
Other public works: Public batteries £
erection alone of public batteries and has
working expenses of public batteries. Th
£15,000 for the purchase of copper ore at
of which I shall deal with later on.
£7,000; rabbit-proof fencing, £28,000; c
the Railway Department there are new w
£25,000 (for sidings and improvements to
that kind of thing, usually paid out of loa
pipes to complete trucks, £14,000; replaci
£33,787; or a total for this purpose exper
of £72,787. Members will see that this is
because of the shipment which was coming
made the subject of a report by the Aud
mencement of this session. That stock w
we provided for it by charging it to last yea
there is no necessity to expend so full a su

Digitized by Google

Subsidies to Municipalities.

In addition to that we have subsidies to municipalities, £65,800; last year the amount was £50,000. This subsidy has been calculated on the scheme which I submitted to the House, and it is the intention of the Government to stand by that scheme, thinking it is a just and equitable one. There will be expended £65,800. Provision has been made, as I stated when moving the motion in relation to subsidies, to pay Perth at the rate of 15s. in the pound up to the end of the municipal year, and 12s. 9d. up to the end of our financial year. After that Perth will require to do as the scheme says, and make provision for the raising of revenue on the standpoint of the scale I then foreshadowed. By placing £65,800 on the Estimates we are getting rid of all internal expenditure on municipalities, recognising as we do that if the Government are prepared to give substantial subsidies, the least the people whose property is benefited within the boundaries of the municipalities shall do is to rate themselves accordingly.

Immigration.

We are placing £2,000 on this year's general expenditure for immigration. The time will come when we will have to tackle this question with much more earnestness, and to expend probably a very much larger sum in order to compete with the other advertising countries of the world.

Charitable and other Grants.

Coming to charitable and other grants, it will be seen that the hospital and medical grants cost this State £95,352 6s. 9d., in addition to which charities, indoor and outdoor relief, and assistance to orphanages, etc., total £23,210. We are giving the agricultural societies this year an increase of £2,200, the amount set down being £4,200, and this increase is to encourage them to get their stock up to the standard we think necessary for a State with such great agricultural and pastoral potentialities as this State possesses. Sanitation grants to local boards amount to £2,500; mechanics' institutes, £3,000; Then we have grants for the extermination of marsupials, wild dogs, etc., £1,700; literary and scientific £14,150; fire brigades, £3,000; Recreation reserves £14,300: this is a large increase on the grant of last year, the increase being I think £5,500. Personally, I am not very much in love with this vote, but I say unhesitatingly that if we have a vote for recreation purposes it should be given on some scientific scale, and it should not be within the power of Ministers to grant exactly what they wish; consequently we have made provision that every town in this State shall receive something from this vote. Benevolent grants, £4,710. Cemeteries, £1,000. In the past it has appeared to be necessary for the Government to do everything inside a cemetery. But we have decided—a decision we arrived at early last year—that so far as the Government are concerned we only intend to fence the outside of cemeteries, and the inside arrangement of them can be left to those who have friends there, or who anticipate going there

Digitized by Google

themselves. National grants, £600. The total amount of charitable and other grants is £167,722 6s. 9d., concrete position of that expenditure is shown on Return No. 9.

Return No. 10. TOTAL EXPENDITURE, THIS YEAR.

SUMMARY OF ESTIMATED STATE AND COMMONWEALTH EXPENDITURE (IN THE STATE) FOR THE YEAR ENDING 30TH JUNE, 1904.

	£	s.	d.	£	s.	d.
Administration, etc.—						
State	2,225,302	2	7			
Commonwealth	380,059	0	0			
General Expenditure—				2,605,361	2	7
State	1,618,045	13	7			
Commonwealth	67,079	0	0			
				1,685,124	13	7
Total	...			£4,290,485	16	2

The estimated amount of expenditure, including Commonwealth expenditure, is £4,290,485 16s. 2d., less revenue-producing departments, £1,306,511 9s. 7d., or a total to be expended of £2,983,974 6s. 7d. This is how we purpose expending it:—Administration (including education, £136,230; police, £129,031; Commonwealth expenditure, £380,059)—£1,298,849 13s. Interest and sinking fund £713,593 6s. 10d., general expenditure £971,531 6s. 9d.; or a total expenditure, less revenue-producing departments, of £2,983,974 6s. 7d.

Local Inscribed Stock Loan.

The last return, No. 11, shows the net result of a £483,215 local inscribed stock loan.

Return No. 11.

NET RESULT, £483,215, LOCAL INSCRIBED LOAN.

	£	s.	d.	£	s.	d.
To Gross Proceeds	...			483,215	0	0
By Expenses—						
Brokerage, ½ per cent. on £406,490	2,032	9	0			
Commission paid Banks for receiving money and issuing Certificates, ¼ per cent. on £400,335...	1,000	16	9			
Advertising and Printing ...	330	17	5			
Postage and Telegrams	35	14	11			
Accrued interest	1,093	10	5			
				4,493	8	6
Net proceeds, after paying Expenses and Accrued Interest	...			£478,721	11	6

The expenses were: Brokerage, £2,032 9s.; commission paid banks for receiving money and issuing certificates, £1,000 16s. 9d.;

Digitized by Google

advertising and printing, £330 17s. 5d.; postage and telegrams, £35 14s. 11d.; and I have put another item here which does not appear in the statement of any other State, that is accrued interest, which is the difference as between 1st May and the 14th, £1,093 10s. 5d., or a cost of £4,493 8s. 6d. to float a loan of £483,215. By comparison with the expenses of another State, which floated a loan of £117,000 more at a cost on the same basis of no less a sum than £8,175, I have reason to be satisfied; but if I had to do it again, I fancy I could do it cheaper than I did in my initial effort. All things considered, I think I have every justification for claiming that the first local loan was an undoubted success. (General applause.) I was blamed for having a subscription instead of a tender loan, but I took the best financial advice I could obtain in the States, going to a great deal of trouble to attain it, and was told to have a subscription loan, and I think there was a good deal of justification in that advice, seeing that the Metropolitan Board of Works in Victoria, probably the most fashionable stock for local investment in Australia, had just before this had a tender loan, and that tender loan had only been partly subscribed, and the balance had to be taken up by the underwriters. It meant that this was the first loan that Western Australia had placed upon the Australian market, and I say unhesitatingly that the market was not a favourable one to Western Australia at that particular time, and consequently I could not afford to take any risk. If I had had a tender loan, I should not have known until I opened the tenders how much I should actually receive. I could not have courted failure, consequently I would have required to have gone to the banks and said to them "I want you to underwrite this loan in order that there may be no failure." They would probably have said, "Certainly; but our price is so and so." If tenders had come in above par, they as underwriters would have taken all that sum above par: instead of resorting to those means, I put a Western Australian loan upon the market, and in doing so I placed before the people, as I have said, the fullest particulars of the financial position of this State, and people in the Eastern States have been good enough to say that it had a material effect upon the ultimate success of the loan, and I put that loan as a subscription loan. The people knew exactly what they were getting, they knew exactly the amount they were paying for it, and I knew from time to time exactly how much had been subscribed; so that had there been any necessity—which there was not—to put pressure on at this end, I would have been in a position before the loan closed to do so, and thus secure and protect the credit of Western Australia. I venture to say that every step I took on that occasion was fully justified, and did credit to the financial position of the State.

General Outlook of Western Australia

These are the last of the figures, and I now draw attention to the general outlook of Western Australia, and I say there is not the slightest doubt as to the position of this State. Our prosperity is steady and solid. The time when our future was speculative h

Digitized by Google

gone, and our prosperity is now an assured fact. Strong evid this is shown in the fact that merchants from all over Austra purchasing city and other properties here, and we have a st and even better evidence than this, the people general acquiring small properties on which to make their homes, a prevailing feeling of unrest, which was characteristic here years ago, has given place to a strong desire to be a citize State which is second to none in the Commonwealth for a with enterprise and energy. During the last two years over buildings have been erected in Perth and its immediate su Whilst this gives evidence of the progress of that settleme all desire to see, may we trust that it will in no way lead to lation on inflated land values, the aftermath of which, judgi the experience of the Eastern States, is disastrous in the ex Our population continues to steadily increase. Last year w spoke it was roughly 213,000, whereas at the end of August 227,000, and we must not lose sight of the fact that the majo this increase consists of adults in the prime and full vigour Of this increase 5,500 came from Victoria, 2,500 principally the agricultural districts of South Australia, over 1,000 fron South Wales, the balance from the other States and the old The sister States have been deploring the fact that their y vigorous life is being attracted to South Africa. Whatever to this life there is that is attactive in South Africa, I vent say that such a phase is more in evidence in Western Aus It is quite natural that the States will have their degrees of sperity, and so far as Australia is concerned that is bou encourage a migratory population; but I think we have a seeing that we are probably the most prosperous State of the at the present time, to ask that the sister States which are their population should point to the fact that Western Austra a very desirable field for young, vigorous life; and even if the some citizens by this process, they have the satisfaction of kn that these people still remain citizens of the Australian Com wealth.

Banking Returns.

If we turn to the banking returns, the medium of commerce investment, we find that a steady, even business has been tained. The total deposits not bearing interest amour £3,336,261, and those bearing interest to £1,449,579, or roug total of £4,800,000. The former have increased during the nearly £300,000, whilst those bearing interest have, owing t advantages of more profitable investment, decreased by £150 the trading and other advances given by the banks show an inc of nearly half a million, proving that our banking institutions every confidence in the stability of the State.

Savings Bank.

As evidence of the thrift of the State, the Savings Bank pro magnificent testimony. During the year the deposits increase

Digitized by Google

nearly £100,000, and the total sum to the credit of depositors in the Savings Bank to-day is nearly two millions of money. The number of depositors is 49,163, and the average amount standing to each depositor's credit is no less than £40 0s. 5d., only exceeded by Queensland in the Australian States. I have recently liberalised the operations of this institution, and have every confidence in predicting that before long it will be what we intended it should be—the bank of the masses.

Trade Imports and Exports.

Our shipping trade still maintains its position; and there is no doubt that with the prospects of a magnificent year in Australia, and Fremantle being the first and the last port of call, this year will show a great increase. The total value of our imports per head for 1902 is £34 16s. 11d., and of our exports £43 13s. 11d. Our imports are £17 per head higher and our exports £23 per head higher than those of any other Australian State. Far from experiencing any alarm at the high average per head of our imports, I consider that this is absolutely one of the best advertisements for the probabilities of the State. For when I say that meat, livestock, bacon, butter, cheese, eggs, wheat, flour, oats, jams, jellies, and fruits represent nearly £1,700,000, it must be clear evidence that a local market whose imports of these necessities, all of which can be produced within our own borders and which total roughly between £7 and £8 per head of our population, is well worth the exploitation of the farming community, not only of Australia but of the whole world. As to exports, not only is our gold export increasing by leaps and bounds, but wool, timber, hides, pearls, sandalwood are all steadily advancing; and I venture to predict that at no distant date we shall add cereals to our exports. The total value of trade per head of population is £78 10s.

Industries, Gold-mining, Batteries, etc.

Let us turn to our industries, and naturally I take first the foundation of Western Australia's present position—her gold industry. The figures for this industry are so colossal that they cannot fail to be of interest not only to us who have grown accustomed to its marvellous growth, but to those outside our boundaries who are interested in our advance. The total production of gold to 30th September, 1903, was 11,816,745ozs., or 492 tons of gold of the value of £44,302,528. The output for 1902 was 2,117,241ozs. The output for this year to the 30th September was 1,842,282ozs. The reported value in 1890 was £86,000; in 1902 it was £7,947,662; for this year to the 30th September it was £6,632,216. The estimated output for 1903 is 2,500,000ozs., of a value of £9,000,000. The dividends in 1891 were £1,875, in 1902 £1,424,272; and for this year, to the 30th August, £1,309,615. Taking the nominal capital of the mines now working at £30,000,000, the dividends declared to the 30th August last, if maintained at the same ratio until the end of the year, will be 6½ per cent. per annum interest on

Digitized by Google

that sum; and I do not think it is for one moment contende anything like the £30,000,000 represented by the nominal c came into this State. The total of dividends declared from till 1903 is £8,795,477. The number of stamps on the 31st 1903, was 3,941; the number of other mills 161; the numl leaching vats 1,198, and of filter presses 138. The number of employed on the 30th June, 1903, was above ground 8,042, u ground 9,570, or a total of 17,612. The diggers numbered 3 and the total value of the mining machinery on the 31st Dece 1902, was £4,304,397. In the year 1902, for every man emp above and under ground there was a production of 117ozs. of to the value of £427 per man. On the total acreage, takin acreage under mining lease last year, the average productio acre was £234 worth of gold. Turning to the State batteries, is no question that under the able and capable supervision o Minister for Mines (Hon. H. Gregory) and his staff, the batteries are proving a splendid success. Up to date 140,000 of ore have been crushed for 170,000ozs. of gold, value £639,000; in addition, 48,000 tons have been cyanided, retu gold equal to £50,000, or a total production from the syste State batteries of no less than £690,000 of gold. The balan the money, deducting cost of treatment, has gone into the po of the small mineowners. Hence by this system of State batt the prospectors and the small mineowners have benefited, and gold won in this manner goes into the pockets of the people of State. The Mines Department has no less than 155 hea stampers crushing at the present time. It is needless to say the Government intend to continue so admirable and profital scheme; and as I said before, £25,000 is provided on the rev estimates of this year for the continuation and extension of principle. At the Phillips River the Government are buying In order to provide a local market for the realisation of the co ore there, the State has instituted sampling works in which ores f the various claims are purchased on their assay value, at such a as will allow a considerable margin for fluctuations. The inten is to test the district by this means, prior to undertaking erection of smelting works and necessary tramways. Up to 1,200 tons of ore have been purchased, which returned to prospectors a sum of £4,500. The assistance thus afforded given a great impetus to that particular district; and I think if returns justify it, every provision will be made by the Governm to assist the development of the copper industry to its grea possible extent.

Minerals generally, Output and Prospects.

Of minerals other than gold the total output to 31st July w Copper ore, 39,392 tons, of a total value of £241,554; block 4,567 tons, of a total value of £259,178; coal, 502,842 tons, o total value of £274,639; and "not otherwise enumerated," £47,8 or a total value for minerals other than gold, to the 31st July, 19 of £823,247. The output of Collie coal for 1902 was 140,884 to

Digitized by Google

or 23,000 tons in excess of the output for 1901; and this industry employs an average, roughly, of 360 to 400 men. The Government Geologist states that we have iron deposits as large and as rich as any in the world; so that we can look forward to great developments in that industry. As to gold, every assistance and encouragement are given for the advancement of our greatest industry; nor are we content with our present discoveries. Prospecting parties have been equipped with camels, and specimens recently brought in from the South Australian border clearly show that deposits of gold and iron exist in the Warburton Ranges. Arrangements are being made to thoroughly test these deposits; and I venture to say that if we find the deposits payable, the fact may have a material influence on that scheme which is dear to all our hearts—the Transcontinental Railway. The Government Geologist has been sent to report on the Pilbara district also; and his report will be awaited with the greatest interest.

Aspersions, and some Results.

Last year I made some remarks on the aspersions constantly cast upon the mining methods of Western Australia. These remarks were resented by the Mine Managers' Association of London, and characterised as untrue. I told this Committee last year that I would take certain action with regard to certain companies, which I said had prepared their balance-sheets for market purposes. I did that, and those companies not only paid the duty but paid the fines; so that practically there is the end of it as regards the State. I may say—and I think it just and right to say it—that so soon as the other companies found that the Government were determined to make them pay the legitimate dividend duty which they should have paid under our Act, although we had to go to extreme measures to convince some of them we were in earnest—when they found we were in earnest they all settled; with the result that the relationship between those companies and the Government is now on a much better basis than it has been hitherto. We find, however, that these aspersions still continue, but while they do, the people are placing the blame where the blame should be placed, not upon the people of Western Australia but upon the mining jobbers and market riggers of their own land. Those who desire to see a straightforward protection of clean methods, and an exposure of some of the questionable methods of the past, can be absolutely certain that they can rely in every case upon the assistance and support of the present Government.

The Mint.

As our gold-mining industry increases, we have every reason to be satisfied with the establishment of a Royal Mint in our midst. The estimated revenue from charges is £29,590. The annuity paid by us is £20,000, so that we are at present making a profit out of the Mint of £9,590 per annum. If we charge interest on the construction of buildings, say £2,000 a year, it still shows a profit of

Digitized by Google

£7,590, thus giving not only a great convenience to the producer, but returning over and above that a very subst profit to the State.

Agricultural and Pastoral Development.

For years past this State was looked upon purely as havin industry, and that mining. It is admitted that the mining in has made marvellous strides; but I venture to predict that, as our development has been in this direction, we shall see a g comparative development in our agricultural and pastoral indu Since last year the area under cultivation has increased by 1 acres, and with the introduction of new methods a very larg now lies in fallow, so that a much larger increased area has directly and indirectly added to cultivation. Last year all ki cereal and root crops showed an increase; but, owing to the drought in the Eastern States, the principal increase was i crops, 12,000 acres more being cut for hay than in the pr years. There has been a very heavy increase in orchard pla also, 700 acres more having been planted than in the previous showing that the orchardists of this State appreciate the benefits of a splendid local market. The average yields per show the wonderful suitability both of the climate and the s Western Australia for agriculture. In wheat the average wa bushels, maize 13½ bushels, oats 16 bushels, barley 12 bushels 19cwt. to the acre, and potatoes 3 tons to the acre. Turning t pastoral industry, while the other States are deploring the dep of their flocks and herds, our figures show a most grati increase—horses 12,000, cattle 40,000, and sheep 74,000. Th no doubt that in the Kimberleys, and in the Gascoyne and chison and our other North-West areas, we have pastoral co second to none in Australia. The justification for my assertio our development will be phenomenal lies not so much in wha been done or in what the selectors who have taken up lan doing, as in the fact that many have taken up land in the las or three years who have practically up to now made no profit their land. Nor has that land yet come under cultivation t extent the applications for it would have justified.

Land Settlement.

If we compare the record of the last year's work in our land s ment in this State with the previous years, I venture to say it record of which this State may very well feel proud. The nu of conditional purchase holdings approved in 1901-2 were 1,37 208,912 acres. In 1902-3, 2,543 were approved, or 398,542 The number of new settlers may be better gauged by the home farms. Those approved in 1901-2 were 411, representing 6 acres. In 1902 to 1903 the approvals were 1,118, represe 176,354 acres; so that practically in one year 1,118 addit farmers settled on our soil, or 700 more than in the previous It must not be forgotten that we have not the teeming millio draw upon that Canada has, and that the majority who take u

Digitized by Google

land and settle upon it come from the Eastern States. Nor is this settlement confined to agricultural centres alone. The pastoralists are beginning to realise our great possibilities both for home and export market. The pastoral leases approved in 1901-2 were 539, representing 22,094,216 acres. In 1902-3 the number of leases approved was 776, representing 29,535,831 acres. The applications approved in 1901-2 were 3,232 for 22,533,447 acres, while in 1902-3 there were 5,281 for 30,402,331 acres. Naturally we have every cause to be gratified with the result of the settlement both in our agricultural and pastoral districts, as we all must recognise that agricultural and pastoral pursuits are settled and permanent industries, and bring in their train other industries that will make this State a hive of employment for the skilled artisan and labourer. The outlook for our settlers here is one that must give them every satisfaction. We have and always have had in our agricultural districts a splendid rainfall, rich and heavy yields, and have, in addition, a local market second to none in Australia; and when we have overtaken the demands of that local market, we are infinitely nearer the world's markets than the sister States of Australia.

Agricultural Bank Advances.

In addition to the facilities given under our Lands Development Act, we have also provided for the struggling settler through the Agricultural Bank. From this source £188,000 has been advanced to struggling settlers, which has been of material assistance in clearing 76,306 acres and cultivating 54,853 acres, also in providing for water supply and the building of fences; the grand total of improvements being no less a sum than £362,503. I think this Committee will agree when I say that one of the most gratifying phases of our land settlement is the fact that our goldfields residents are making applications for lands in our own State. I am sure every one of us will welcome the marriage of the strong, vigorous manhood of the goldfields with the coy maiden of husbandry, and I am certain that this will lead to a much better feeling existing between the fields and the agriculturists than any platitudes issuing from the mouths of politicians, because we recognise and they recognise that these two great industries developed to their fullest extent, mean that the future, bright and prosperous, of Western Australia will be written in very large letters, and very strong letters too.

Timber.

The timber industry is showing increased activity. New markets at Manilla, in India and China, and even when we come closer home in New Zealand, and in the Eastern States, are being opened up, and, in addition to that, large quantities of Western Australian timber are being used in architecture and joinery. So we see what we hitherto in many instances have wasted is now being put to profitable use. The estimate of the output from our timber industry for the present year, according to our best authorities, will reach nearly £1,000,000. A royal commission has been collecting valuable

Digitized by Google

information on the present and future pr
doubtless its recommendation will receive
of this House.

Wool, Pearling, and Man

The wool clip yielded £80,000 more las
year, and the known increase in the pearli
was £48,000. While our natural indust
have said before, with great strides, our m
to make strong and steady progress as we
according to the increase of settlement wh
agricultural districts, manufacturers will
a market for the production of all kinds
none in Australia. The number of fac
employing 11,221 males and 1,316 fem
people altogether. I think that I have ev
brief review of the position of our indust
is before us a future rich indeed in the c
and unqualified prosperity which is the de

Education—Primary, Secondar

In education it will be found that we ar
of the times, and in every possible way we
vide education for the rising generatio
appreciated is shown by the fact that in 1
of 14,424 scholars, while in 1902 we ha
increase of 57¾ per cent. At the end of t
were 24,172 children on the rolls. The te
391 and 677 in 1902. The number of sch
250 in 1902. The expenditure on schoo
1902 was £146,703. We have establishe
continuation and technical classes, and the
improving attendance testifies to their u
established a training college at Claren
supplying teachers to meet the growing d
Provision is now contemplated for sec
foreshadowed in the Governor's Speech, v
vision for the endowment of a university,
is now before Parliament.

Goldfields Water Sup

Now we turn to the Goldfields Water Sch
for years has been complete without refer
My reference is a fairly pleasant one; in
last year I said the time for talking had g
altogether too much talk and too little w
was that each member of the House was
dread as to the ultimate success of that
we would open the water supply at t
good deal of doubt on the subject wa

Digitized by Google

to the very great energy shown by my colleague the Minister for Works (Hon. C. H. Rason) and the officers under him, that scheme, possibly the greatest engineering scheme of its kind if not in the world at least in the Australian States, was opened, and fittingly opened, by Sir John Forrest, on the 26th January of this year, amidst great enthusiasm and in the presence of representative men from all over Australia. No sooner was that scheme completed than doubts were expressed whether we could provide a sufficient quantity of water to make it a payable proposition; but to-day we are in the happy position of knowing that the Mundaring Weir is overflowing, that the dam contains nearly 5,000 million gallons of water, and that by it containing that quantity of water we are relieved of any doubt as to the success of that scheme at its material end. All that is now necessary is to give all reasonable conveniences to consumers, and this we are endeavouring to do by reticulation in the principal towns, and we anticipate next summer this scheme will fulfil the highest anticipations from all the standpoints of those who planned it. Standing as we did a few days ago looking at the completed work, and having the recollection of having given all honour to the statesman who initiated it, I venture to say there was not one of us who did not regret that Mr. C. Y. O'Connor, who gave his life practically for that scheme, was not present to realise its full consummation.

Fremantle Harbour.

Now we have the Fremantle Harbour. It is another great work, and to a certain extent it has been completed; and having put it under the control of a harbour trust, we are satisfied that under their business management nothing will be neglected that will conduce to its popularity with the shippers who use it. There is still one necessary work in connection with the Fremantle Harbour, and that is the Dock. Every possible haste will be made to provide this, in order that the port of Fremantle, and through the port of Fremantle the State, may realise every benefit from the large expenditure that has been made there; and without this dock we are quite satisfied that the work cannot claim to achieve its full possibilities.

Loan Works and Loan Policy.

Coming now to the question of loan works. When delivering my last Financial Statement I stated I looked on the temporary closing of the doors of the London loan market as a blessing in disguise for Western Australia. May I say now, 12 months later, that I see no need to alter that opinion other than to add the words, "Australia generally" after "Western Australia." My reasons are, first that the closing of the market will cause a minute examination of our administration expenses, so that all savings effected may be employed in works of a developing character. In the second place it means that we shall require to have every justification for a work before we ask for a loan expenditure for it, and that work will have to stand the closest possible scrutiny before we stand a chance

Digitized by Google

of getting our money. In other words, the works will have free from political influence, and their only recommendation that they have in them the elements of an interest-paying pro tion. If we look at the present position from that standpoin must be satisfied the closing of the doors of the London m market was a blessing in disguise for Western Australia, the r being that not only our administration, but our public work which we require to borrow money, will be placed on a bus basis, and whilst the shoe may pinch us at the present time ultimate result will be full compensation for the hardships of present. There is no disguising the fact—and on this point I made every possible inquiry—if Australia wants money during next three or four years she will have to face a four per market; consequently any State that, in the face of the pre outlook, can with a light heart propound what we frequently called a strong and vigorous public works policy, necessitating l appeals to the loan market, is courting internal and fina disaster. Canada, New Zealand, Queensland, New South W and South Australia, all recognise the position, and as a result advocating, if not an entire cessation of those works, at lea modification of loan expenditure on public works for some tim come; and this Government, which probably has more justifica in view of the great developments and the great possible deve ments which we see before us, than any other State of Australi bound to recognise the same position. As a result we pro cutting our coat according to our cloth, and we only inten spend during the present year £750,000 upon loan works. sum asked for will probably exceed that amount, but we shall expend, under any circumstance, more than the sum mentio Last year we expended £1,700,000 of loan money. A very l proportion of this was spent in London. This year, out of the we shall have to spend, a very large proportion of it will be s within the boundaries of the State. This State has an abso right to know how I intend to finance that £750,000. I sta the financial year with £103,000 to the credit of loan funds. members will turn to Return No. 3, they will see we l authorisation for £133,555. When the Premier delivered policy speech I was besieged by offers of that money f the other States, but having no necessity for it at that tim did not avail myself of these offers. Since then they l been renewed, with the consequence that I have floated £133,555 in Australia at four per cent. at par, interest able from the time the money is paid, so that I have a thir the £750,000 provided. Our bankers in London have told us t will advance us, until there is some reasonable hope of a chang the London market, £250,000 at three and a-half per cent., and purpose placing another local inscribed stock loan, after we h exhausted our funds, on the Australian market some time towa the close of the financial year. Of the success of this loan, if flo on the same basis as the last loan, I am already assured, so that have every reasonable probability of providing the whole of

Digitized by Google

£750,000 to carry out the necessary loan works in the State during this year. That is the position for the present year, but I would like the House and the country to recognise that if the English market does not improve, then we can see before us a very strong curtailment of the expenditure of loan moneys on our public works. Personally I am adverse to a large loan expenditure for the next three or four years.

Prudence in Loan Projects.

We hear a good deal about the mandate of the people on the question of a redistribution of seats and other great principles. I should like to see members of the House who purpose seeking re-election come back from the country with a mandate to see that our loan expenditure shall not exceed anything from £500,000 to £750,000 per annum during the currency of next Parliament, and as far as possible to have that money borrowed in the Australian States. I am certain of this fact, after making careful inquiries, and that too at a time when Australia is practically recovering from the great disaster of her drought, that according to the expert opinions of financial men in every State, Australia can lend Australia anything from £2,000,000 to £2,500,000 per annum, provided that the principal is kept and interest paid within the boundaries of Australia, and I am quite satisfied of this fact, that so long as Western Australia pursues her present policy and makes ultimate provision for the redemption of her debt, Australia will be perfectly willing to lend Western Australia the sum we require up to practically £750,000. I want to see us borrow our money in Australia, because it seems to me it will lead to a more careful scrutiny by the people lending us the money, and that when we propose a work that bears upon its face rather a political significance than a developing one, we can rest assured that the people who are lending us the money will express such an opinion that will teach us to only present to them works which are directly and distinctly revenue-producing. With the exception of the payment for the Malcolm-Laverton railway over and above the £70,000 provided in the revenue estimates, and the rails and fastenings for the same, the Collie-to-Goldfields railway, the Bunbury harbour works, and the Fremantle dock and slip, totalling roughly £170,000—because the metropolitan water supply and sewerage are not included, as these works will be constructed and financed on a separate basis—nearly the whole of the balance which we require, with the exception of administrative expenses, is to complete works authorised years ago. Inside and outside the House, both by members and the Press, the Government have been twitted with having no conception of forward enterprise. Every credit has been given, and it has not been begrudged, to those who conceived our great works. But let the citizens of Western Australia not forget this fact, that the obligation not only of completing these works, and of practically rescuing its biggest public work from chaos, but also of financing them in the face of a very stringent market, has been the heritage of

Digitized by Google

Leake and James Governments, who, whilst sharing none praise, have had all the anxiety and drudgery of providing fo completion, and we have done this without in any way dan the credit of the State.

State Borrowings and Sure Results.

It seems to me that the present is a fitting opportunity to a strong blow at the generally accepted idea, which had cally become a faith, that Australia can only prosper by borrowings. Too frequently huge borrowings lead to that perity which we know is unstable and carries with it the str possible germs of corresponding depression, which in turn to be relieved by further borrowing. Another reason wh frequently advanced is that, if we have to wait till our resources are developed by our own capital, our progress mu very slow indeed. In the minds of thoughtful men, five ye nothing in the history of a nation, provided those five yea represented by slow and steady progress; and business men tell you that ultimate prosperity rests with the man of energ enterprise, who, whilst looking ahead, is certain of providing f immediate obligations; and if this applies to business, it ought a good principle to apply to the State. If the prosperity co from internal development be slower, there is not the slightest it is surer. We have strong evidence of that fact in the development which has taken place under our public la system. Moreover, the national life is sturdier and more ind dent, for there is not the slightest doubt that the whip of nec is a strong incentive to development; consequently I hope w see that Western Australia and Australia, so far as these idea influence Australia generally, must put more energy into development of some of those natural resources which indeed her great heritage. But if by any circums we have to look forward to an absolute closing of London loan market, then how do we stand? No State is l equipped to initiate a policy of moderate and business borro than this State. The London market may be closed, but I ve to say that so long as our borrowings have in them an eleme business productiveness, we can get along very quietly on a moderate estimate, and obtain the required money in Australia

A Successful Future.

We still have, even under these circumstances, a future stro the elements of prosperity. If we produce £9,000,000 worth of it is a fair thing to say that the cost of production will amou £7,000,000. Then there will be spent on unproductive wo our goldfields something like half a million, and in wages fo timber mills £750,000, and in our other industries, say, £750,000 that a total of £9,000,000 must be spent in ready cash in State practically in wages during every year; that is without t into consideration any other expenditure at all. This n £40 per head of the population of the whole of the State;

Digitized by Google

venture to say that whatever may happen, the ultimate outcome of the present monetary tightness can only influence us for a time, but under any circumstances we need have very little dread in looking into the future.

London Financial Criticism.

Now I come to a question which has not only been agitating this State, but the whole of Australia—London financial criticism. During the year very severe criticism, originating in a very exaggerated and scaring article published by the *Daily Mail*, has been passed by English papers upon Australian finances and Australian financial methods; and these, in conjunction with other influences, have had a material effect upon our colonial stocks, which have been subjected to a very heavy fall as a consequence. Our stock, in common with the stock of other States, has suffered from the reason that the British investor looks upon Australia as a whole, and does not consider either the financial stability or the financial methods of any State in particular. When the article was published in the *Daily Mail*, I recognised that this was the outlook from the British investor's view; and I cabled the Agent General to publish an article in that paper showing the difference between Western Australian finance and Australian finance, but the *Daily Mail* absolutely declined to publish that letter and statement. I notice, however, that the representative of this journal now in Australia admits that Western Australia stands on a pedestal by herself, and that so far as her public finance is concerned there is much in it which is commendable, and that practically we are suffering not for our own faults, but for the faults of the other States. The Treasurers of the other States are quite capable of defending their own position. I desire to place before all who are interested in the financial stability of Western Australia a clean business statement of how we spend our money, and that clean business statement is shown by Return No. 4. In railways, tramways, electric telegraphs, harbour and river improvements, public buildings, water supply and sewerage, development of goldfields and mineral resources, roads and bridges, development of agriculture, immigration, and miscellaneous we have spent, as I have shown earlier in the evening, £15,807,698 7s. 3d.

Loans, how Expended.

Now I particularly desire to draw attention, seeing that I am speaking to people outside of this State, to the fact that whilst the other States charge all their expenditure on public works and public buildings to loan account, Western Australia, while spending £2,850,000 on public buildings and roads and bridges, has only paid £209,000 from loan funds on account of those works. If members look at the particulars of the other items, I think I can claim that the railways and tramways, electric telegraphs, harbour and river improvements, water supply and sewerage, can be called distinctly revenue producing. If we add £300,000 as the [illegible] represented by the purchase of land on the Great Southern Ra[illegible]

Digitized by Google

which is returning a very fine income, it will be found, I think they total £14,582,510, practically leaving only £1,225,000 t charged to indirectly reproductive expenditure; and if addit security is required for that million and a quarter, they hav sinking fund and stock redeemed, which at the end of the will reach a total of no less a sum than £1,012,000. So to pu position bluntly, if our creditors were in a position to fore upon us, the assets represented by the public works in whicl have invested the money that we have borrowed from them w give them 20s. in the £ without that which is behind it, and which is behind it is this, that we belong to a people who have g a promise to pay, and when we have given a promise to p venture to say there is no such word in our vocabulary as "r diation." Whatever it cost the State to redeem these debt venture to say that the word of the people of the State is practi behind any engagement into which we enter.

Ability to Repay.

Let us look at what rates of interest these are returning. average rate of interest paid by this State for loans raise £3 9s. 6d. per cent., the lowest rate of any of the States. On estimates for the present year, and judged by what they did year, the railways will, after paying all working expenses providing £72,787 for the upkeep of rolling-stock and o necessary work, pay £3 14s. 8d. per cent. on, roughly, £9,000 of money. So we are practically receiving a quarter per cent. n than we are paying. It is difficult to estimate the net earn from telegraphs and telephones, but the gross anticipated reve is £43,900. Harbours and rivers: Fremantle Harbour W have not reached the full limit of their profit, but even on estimated return this loan expenditure will pay interest this y roughly, at the rate of £2 12s. per cent., but when in full profit Harbour Trust anticipate they will pay four per cent. on the ou of that great work. The expenditure on water supply will on year's estimate return a trifle over £2 7s. per cent., and as the no question now of having any quantity of water at this end, i quite possible that the present summer will see such developn in the demands that within a very short time indeed we may l forward to this scheme at least paying full interest. In additio the earning capabilities I have shown that these works possess, it not be forgotten that we have behind absolutely our sheet-an in our sinking fund; that fund is a general charge on the reve of this State, varying from one per cent. to three per cent. on these works; so that, as I said some little time ago, if we did borrow any more money from the British investor and kept up t sinking fund, we would in 35 years at the very outside not owe British investor one solitary penny. It is fitting under tl circumstances that I should make some remarks as to our stock the London market. With the knowledge that we possess of t fund and with the knowledge of how we use it, we are the

Digitized by Google

State which, to a limited extent, can look with equanimity upon the drop in our stocks on the London market. Especially well does this apply if we restrict our future borrowing to the Australian market. By means of our sinking fund we purchase our own stock. Our sinking fund amounted at the end of the year to £655,069; £436,408 was in our own stock; and this is our position to-day, that so far as this sinking fund is concerned we are purchasing our own stock at a discount of £14 and £3 respectively. Consequently, the lower the stock goes, the greater benefit shall we receive from that sinking fund; and if the British investor, through lack of knowledge of the value of the securities which he holds, is prepared to sell us a sovereign for 17s., then I venture to say this State is perfectly willing to avail itself of the opportunity of purchasing that sovereign to the full extent of the State's sinking fund.

Concluding Remarks.

May I say that I have foreshadowed a bright future, tinged with a sense of responsibility and caution. I think the desire of every member of this House and of every person in this State is to see that each step of our progress carries with it no germ of retrogression. We have in this State the richest possible material which goes to build greatness. We have gold, copper, tin, iron, and coal for our foundation. We have timber for our supports, pearl for the adornment of that building, and we have oil and wine for its consecration. We have wool to clothe our people; and we have corn, meat, fruit, milk, and honey for their sustenance. We need but courage and wisdom in our counsels, the trowel of honesty in the hands of our master-builders, righteousness and justice as the foundation of our judgments, industrial peace within our borders, to make of this stone—a stone which a few years ago was a despised stone—the chief corner-stone in the completed temple of an Australian nation. I beg leave to move the first item on the Estimates, "His Excellency the Governor." [General applause.]

Digitized by Google

Digitized by Google

ALPHABETICAL INDEX.

Subject.	Vol. I. Pages.	Vol. II. Pages.
A.		
Aboriginal Cave Drawings	197-200	
Aborigines	196-211	28, 395
Control of	208, 209	
Census of	210, 211	
Criminal Statistics o	...	418
Missions among	209, 210	395
Acacia	300, 302 317, 318	
Accidents	...	54
Accident Insurance	...	361
Acclimatisation of Fish, etc.	284, 285, 489, 490	
Acreage of Land alienated from the Crown ...	...	181, 493
Western Australia	99	187
Acreage under Crops	...	192
Fruit Trees	...	209
Vines	...	209
Accumulation	...	334-361
Administration of Justice	420-426	
Admiralty Court	421	
Adjustment of migration figures	...	3, 4
Ages at Census	...	16, 17
Death	...	41, 42
Marriage	...	60-62
of Parents	...	36, 37
Agricultural Areas open for Selection	...	204, 205
Associations (*see* Associations).		
Bank	...	182-185
Halls (*see* Associations).		
Industry	...	187-223
Lands Purchase Act, Estates acquired ...	...	203
Products, Imports of	...	199
Statistics	...	192-198
Agriculture, Breadstuff returns	...	195, 515-517
Crops, Acreage of, in Electoral Districts (1900, 1901)	...	196-198
Dairy Products imported	...	200
Department of	...	212
Tables—		
Area under Crops per head of population ...	...	192
Acreage of principal Crops	...	192, 495, 536
Total Yields of principal Crops	...	193, 496, 537
Average Yields of principal Crops	...	194, 497, 537
Tropical (Beagle Bay)	...	219-223
Alienated Lands	...	181, 493
Alluvial Mining Dispute	39	
Anglican Church	...	377, 371
Anigozanthos (Kangaroo paw)	304, 336	

Digitized by Google

Subject.	Vol. I. Pages.	Vol Pa
Animals, Native	211-220	
Legislation on	273-275	
Ante-nuptial Conception	...	35,
Ants	291, 292	
Appeals, Supreme Court	421, 422	
Appendices	...	461-
Archæan Rocks	104-106	
Area of City of Perth	158	
Forest Land	357	
Land Alienated from the Crown	...	181,
Municipalities	391	
Western Australia	99	181,
taken up by Timber Companies	...	30
Areas, Agricultural	...	204,
Armed Land Forces	427-430	
Arrivals	...	4, 5, 463
List of First	20	
Art Gallery	481-483	
Artesian Bores	456-475	
Articles of Consumption (Average Prices of) ...	...	431-
Export	...	8
Import	...	82,
Artillery (*see* Military Defences)	427, 429	
Asbestos	118	27
Exported (1899-1901)	...	27
Assembly, Legislative	387-390	
Assets, Statements of Banks'	...	338-
Assisted Immigration	...	10, 11, 4
Associations, Halls, and Institutes	...	389-
Agricultural and Horticultural Associations	...	389,
Agricultural Halls	...	390,
Literary Societies and Institutions	...	391,
Miners' Institutes	..	39
Assurance, Liabilities and Assets of Companies ...	...	35
Revenue and Expenditure of Companies ...	...	35
Policies issued by Companies	...	357-
Assurances, Endowments, Annuities	...	357-
Western Australian Business	...	357-
Industrial Policies	...	358-
Average Assurance per Head	...	36
Life	...	353-
Life, Companies	...	354,
Astronomical	486-488	
Asylum, Lunatic	...	39
Audit Act	...	31
Australasia, Birth Rates in	...	38, 5
Death Rates in	...	56, 5
Marriage Rates in	...	64, 5
Capitals, Population	...	8, 5
Capitals, Latitudes and Longitudes	102	51
Colonies, Mail Subsidy to Shipping Companies	...	15

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
Australasia, Gold Production	...	539
Finance	...	524-532
Finance, Expenditure from Revenue	...	526
Due Dates of Public Debt	...	530, 531
Interest payable on Loans	...	532
Loan Expenditure	...	527, 528
Public Debts	...	529
Imports and Exports	...	85
Shipping and Commerce	...	533-535
Shipping, Imports, and Exports	...	533
Exports of Wool	..	534
Imports and Exports of Coin and Bullion ...	...	535
Crops, Acreages, 1902-3	...	536
Yields of Principal Crops, 1902-3	...	537
Yields per Acre, 1902-3	...	537
Live Stock, 1902	...	538
Dairying	...	538
Land Settlement, 1902	...	539
Value of Mineral Production, 1902	...	539
Post and Telegraphs (1902), Offices, Revenue, and Expenditure	...	540
Post and Telegraphs—Letters, Newspapers, etc.	...	541
Railways, 1902	...	542
Law and Crime, 1902	...	543-546
Probate and Bankruptcy, 1902	...	543
Cases tried by Magistrates, 1902	...	544
Summary Convictions by Magistrates, 1902	...	545
Superior Courts and Gaols, 1902	...	546
Charitable Institutions, 1902	...	547
Education, 1902	...	548-550
Schools and Staffs, 1902	...	548
Scholars, 1902	...	549
Cost of Instruction, 1902	...	550
Population...	...	8, 520, 521
Statistics, Comparative	...	519-552
Illegitimacy	...	34, 521
B.		
Balance of Trade	...	80
Bank, Agricultural	...	182-185
Holidays	...	437
of Western Australia	25, 26	
Savings	...	349-353
Bankruptcy	...	426, 427
Jurisdiction in	420, 421	
Banks, Branches of	...	336, 337
Banks of Issue	...	334-349, 477, 478
Liabilities and Assets	...	338-347
Liabilities (1902)	...	338
Assets (1902	...	339

Digitized by Google

Subject.	Vol. I. Pages.	Vol. Pag
Banks of Issue, Comparative Statement (1893-1902)	...	340,
Discount Rates	...	34
Capital	...	348,
Banksia	303, 326, 350	
Barristers' Admission Board	422-424	
Batteries, Public Crushing	...	283,
Bays, Gulfs, etc.	95, 96	
Bêche-de-mer Fishery	283, 284	
Bees	292, 293	
and Honey	...	20
Pigs, Poultry, and	...	227,
Beetles	286-289	
Bills of Sale	...	42
Birds	220-261	
Birthplaces of the People	...	17-
Birth Rate, "Crude"	...	29,
Rates	...	29-3
Rates, Australasian	...	3
Rates, Metropolitan, etc.	...	31,
Births	158	4, 5, 2
1894-1904	...	46
1891-1901	...	4
Illegitimate	...	33-
in Seasons	...	30,
—Twins, Triplets, and Still	...	32-
Blackbutt	355, 357	
Blind Institution	...	39
Boards of Health, Local	417-419	
District Roads	413-416	
Bonding Warehouses	...	103,
Bores, Artesian	450-475	
Boronia	306, 310	
Botanic	298-341	
Boundaries of Ports	444, 445	
Breadstuff Returns	...	195, 51
Breweries	...	307, 30 31
Bubonic Plague	46	
Building Societies	...	38
Bullion, Export	...	53
Bunbury Harbour Works	439, 440	
Butterflies	293, 294	
C.		
Cabinet, Western Australian	383	
Cable Communication	...	160,
Cables—		
Roebuck Bay	...	16
Port Darwin	...	16
South Africa	...	16
Cadet Corps	427	

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
Cainozoic Rocks	113-116	
Cambrian Rocks	106	
Cancer	...	51, 52
Capes	96	
Capital (Perth)	158-160	
Capitals (Australasian)	102	
Carboniferous Rocks	108-111	
Causes of Death	...	43, 44, 46-55
Cave Drawings, Aboriginal	197-200	
Caves, South-West District	124-135	
— Description of	129-135	
Census of Population	48	1-3, 12-28
Population of Towns	158-195	512-514
1901, compared with Rough Census, 1903 ...	...	510-513
Cereals, Cultivation of	...	187-198
Importation of	...	199
Charitable Institutions	...	392-397
Homes for Aged	...	392
Outdoor Relief	...	393
Industrial Schools	...	393, 394
Government (Girls), Subiaco	...	393
Orphanage, R.C. (Girls), Subiaco	...	393
Orphanage (Girls), C. of E., Perth	...	393
Orphanage (Swan), C. of E. (Boys)	...	393
Orphanage, St. Kevin's (Leederville), R.C. ...	...	393, 394
Orphanage, Clontarf (Victoria Park), R.C. ...	...	394
Industrial School, Collie, Salvation Army (Boys and Girls)	...	394
Rottnest Reformatory (Boys)	...	394
Labour Bureau	...	394
Native Institutions (New Norcia, R.C.; Swan, C. of E.)	...	395
Children's Hospital, Perth	...	395
Blind Institution	...	395
Deaf and Dumb Institution	...	395
Other Institutions, Home of Peace, etc. ...	...	395
Lunatic Asylums	...	395
Hospitals	...	395, 396
Childbirth, Deaths due to	...	53
Children, Causes of Death of	...	43, 44
Chinese Population	...	28
Christian Brothers' College	...	370, 371
Christmas Tree (Nuytsia floribunda)	307, 323	
Churches and Clergy (*see* Religion).		
Church of England	...	377, 378
Cities of Australasia, Population of	...	8, 519
Civil Court, Establishment of	24	
Cases, Minor Courts	422	427
Sittings, Supreme Court	424, 425	
Classification of Causes of Death	...	43, 44, 46-55
Climate	135-157	
Close Seasons	273	
Coal	...	279

Digitized by Google

Subject.	Vol. I. Pages.	Vo P
Coal and Coalfields	76, 77	
Produced and Exported	...	1
Mining, Machinery for	...	1
Coastal Surveys { King's	12	
Coastal Surveys { H.M.S. "Beagle"	53, 54	
Coast-line	95	
Cockatoos, etc.	243-246	
Coin and Bullion, Imports and Exports (Australasian)	...	1
in Banks	...	345, 3
Collie Coalfields	...	1
Colonisation and Early Settlement...	19-22	
Commerce	...	74
Commissions (Supreme Court)	...	4
Commonwealth and State	359-370	
Parliament	368, 369	
Population, 30th June, 1903	...	1
Adult Population, 30th June, 1903	...	1
States, Public Debt of, 30th June, 1903	...	1
Companies Registration	...	4
Conference of Statisticians	44	1, 12, 3
Conjugal Condition of the People	...	2
at Marriage	...	6
Consolidated Revenue Fund	...	31
Constitution Act of W.A.	379	
Early	371-378	
Present	378-390	
Consuls of Foreign Countries	...	4
Consumption, Prices of Articles of	...	43
Contingents, South African War	43-49, 427-430	
Contour of the Country	98	
Contracts for Conveyance of Foreign Mails ...	...	15
Convent, Notre Dame	...	37
Convicts	27, 31	
Convictions, Summary	...	40
Coolgardie Exhibition	42	
Water Supply	451-456	
Copper	...	26
and Lead	75-79, 81, 93, 94	
Ingots Exported (1900, 1901)	...	1
Ore Exported (1853-1901)	...	1
Ore Raised, and Value (to end of 1901) ...	...	1
Mining, Machinery for	...	1
Cost of State Education	...	36
Council, Executive ... ... {	23, 24, 373-375, 379-383	
Legislative ... ... {	24, 375-378, 384-386	
Court, Supreme	420-425	42
Courts, Local, Sittings	426	4
of General Sessions	421	
of Quarter Sessions	425, 426	4

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
Courts, Police	422	411-415
Wardens'	...	427
Crime (Criminal Statistics)	...	397-426
Criminal Sittings, Supreme Court	425	
Crop Returns	...	192-198, 218, 219, 495-497, 536, 537
Crown Lands (*see* Lands).		
Cultivation (*see* Agriculture).		
Currency	...	343-346
Customs Duties, Revenue	...	92, 93
D.		
Dairy Products (1902)...	...	228, 538
Dead Letters	...	155, 156
Deaf and Dumb Institution	...	395
Death, Causes of	...	43, 44, 46-55
Ages at	...	41, 42
Rate, "Crude"	...	39, 40
Rates	...	38-40, 44-46, 64-74
Rates, Australasian	...	56
Rates, Metropolitan, etc.	...	45, 46
Deaths	158	4, 5, 38-56
1891-1901	...	4
1894-1904	...	467
Quarterly Statistics (10 years)	...	44
in Seasons	...	44, 45
Due to Child-birth	...	53
Of Children	...	43, 44
in Public Institutions	...	45
Debt, Public	...	326-332, 474, 529-532
Declared Townsites	100-102	
Defences (*see* Military).		
Denominational Schools	...	369-371
Departures	...	4, 5, 8-10
Devonian Rocks	107, 108	
Diamonds	91	279, 280
exported (1901)	...	279
produced (1899)	...	280
Diarrhœal Diseases	...	43, 44, 47, 49, 51
Dingoes	217	
Reward for destruction of	275	
Discount, Rate of	...	347
Discoveries, History of Mineral	75-94	
Discovery and Early History of Western Australia	1-18	
of Gold in Western Australia	75-94	
of Diamonds	91	
of Coal	76, 77	

Digitized by Google

Subject.	Vol. I. Pages.	Vo Pa
Discovery of Lead and Copper	75-79, 81, 93, 94	
of Tin	85, 93, 94	
District Roads Boards	413-416	
Dividends paid by Gold Mining Companies ...	...	294, 2
Divorce	...	4
Divorced Persons	...	2
Drunkenness	...	4
Duties, Customs	...	9
Dynamite (use in fishing prohibited)	280	
E.		
Early Constitution	371-378	
History, Discovery and	1-18	
Settlement and Colonisation	19-22	
Education	...	36
Establishment of System	...	
General Features, Compulsory and Free ...	...	
Management	...	
Teachers	...	36
Training College	...	
Scholarships, Exhibitions, and Bursaries ...	...	
Statistics, 1899-1902	...	
Finance	...	36
Cost per head	...	
Enrolment and Average Attendance	...	
Compulsion	...	36
University and Technical	...	36
Evening Classes (Technical)	...	36
Private Schools	...	36
Secondary Schools	...	36
of the People	...	2
Electoral Districts	387	
Provinces	384	
Electorates, Federal	368	
Electors on Roll	386, 389-390	50
Qualifications, etc.	385, 388	
Electric Telegraphs	...	15
Emigration	...	4, 5, 8
Chinese	...	46
Countries to which	...	
Nationalities	...	46
Emu	260	
English, Foreign, and Interstate Mail Service ...	...	15
Entomology	285-297	
Estates acquired under Land Purchase Act ...	...	
Eucalyptus	302, 322	
Events, Historical	22-50	
Everlastings (*Helichrysum, etc.*)	302-303, 327, 328	

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
Examination of Lunatics	...	415
Examinations, Adelaide University	...	366, 367
Exchange on Drafts and Bills	...	348
Excise, Revenue from...	...	92, 93
Executive Council	23, 24, 373-375, 379-383	
Expectation of Life	...	64-74
Expenditure, 1902-1904	...	469
State and Commonwealth (1894-1904)	...	470
Commonwealth (W.A.)	...	472
State and Commonwealth (W.A.), per head ...	...	473
Loan (*see* Finance).		
Naval and Military	428	
Exploration in Western Australia	50-75	
Exports	...	74, 77-81, 84, 85, 89-92
Notes on	...	89-92
Produce of the State	...	81, 84, 89-92
of Australasia	...	85
From Ports of W.A., 1901-1903	..	483
Live Stock	...	224
Gold	...	81, 89, 485, 490, 491
Wool	...	90, 91, 485
Pearls and Pearl Shells	...	91, 485
Sandalwood	...	91, 485
Timber	...	89, 90, 485
1894-1903	...	481, 482, 485
Copper	...	485
Tin	...	485
Hides and Skins	...	485
Skins	...	91
Extra-tropic Plants	308-341	...
F.		
Factories and Industrial Establishments	...	307-314
Factories and Industrial Establishments (1897-1902)	...	307
Factories, Employees, etc.	...	310, 499-504
Comparative Return (1900-1901)	...	311
General Return (1901)	...	313
Factory Products	...	307, 498
Farms, Experimental	...	218
Free Homestead	...	173, 174
Fauna	211-297	
Federal Departments	368	
Electorates	368, 369	
Representatives	368, 369	
Governor General	370	
Tariff	361-363	
League	365	
Government	359-370	

Digitized by Google

Subject.	Vol. I. Pages.	Vo P
Federal Convention	360, 361	
Constitution	361-369	
Enabling Act	360-367	
Federation Conferences	359-360	
Referendum	365-567	
Fence, Definition of	...	
Finance, Public	...	31 46
Municipal	402-413	
Private	...	33
Consolidated Revenue Fund	...	
Commonwealth Revenue and Expenditure ...	...	31
State Revenue	...	
Taxation	...	31
Land Revenue	..	
Mining Revenue	...	
Revenue, Decennial Table (1892-3 to 1901-2)	...	
State Expenditure	...	
Commonwealth and State Expenditure (1892-3 to 1901-2)	...	
Revenue and Expenditure, Comparative Return (1830 to 1901-2)	...	
General Loan Fund	...	32
Loans, Receipts and Expenditure (1901-2) ...	...	
Loans, Heads of Expenditure	...	32
Loans, Expense incurred in raising	...	
Public Debt (*see* Public Debt).		
Financial Statement by Colonial Treasurer ...	...	55
The Past Year (1902-3)	...	55
Revenue Estimated and Received	...	55
Expenditure for the past Year	..	55
The State Balance Sheet	...	55
Stores Account, how adjusted	...	
Savings Bank Account, etc.	...	
Loans and Indebtedness	...	56
Loan Moneys, how expended	...	56
Railway Estimates	...	56
Dividend Duties	...	
Expenditure Estimated for Current Year ...	...	56
Increases in Expenditure	...	57
Revenue-producing Expenditure	...	
General Expenditure Estimated	...	57
Subsidies to Municipalities	...	
Immigration	...	
Charitable and other Grants	...	
Summary of Estimated State (W.A.) and Commonwealth Expenditure (1903-4) ...	...	5
Local Inscribed Stock Loan	...	576
General Outlook of W.A.	...	577
Banking Returns	...	578
Trade, Imports and Exports	...	5
Industries, Gold Mining, Batteries, etc. ...	...	579
Minerals Generally, Output and Prospects ...	...	580

Digitized by Google

Subject.	Vol. I. Pages.	Vol. II. Pages.
Financial Statement—*continued.*		
Aspersions, and some Results	...	581
The Mint	...	581, 582
Agricultural and Pastoral Development ...	...	582
Land Settlement	...	582, 583
Agricultural Bank Advances	...	583
Timber	...	583, 584
Wool, Pearling, and Manufactures	...	584
Education—Primary, Secondary, Technical...	...	584
Goldfields Water Supply	...	584, 585
Fremantle Harbour	...	585
Loan Works and Loan Policy	...	585-587
Prudence in Loan Projects	...	587, 588
State Borrowings and Sure Results	...	588
A Successful Future	...	588, 589
London Financial Criticism	...	589
Loans, how expended	...	589, 590
Ability to Repay	...	590, 591
Concluding Remarks	...	591
Finger Prints (Identification of Criminals) ...	...	407-409
Fire Insurance	...	361
Brigades	419	
First Immigrants	20	
Ministry under Responsible Government ...	381, 382	
Fish	269-273	
and Fisheries	275-285	
Acclimatisation	284, 285	
Regulations, etc.	278-281	
Prohibited Waters	278-280	
Fisheries	..	301-306
Pearl Shell, Particulars, 1901	...	304
Pearl Shell, Particulars, 1896-1901	...	305
Nor'-West Pearling	...	306
Shark Bay Pearling	...	306
Oyster	284	
Turtle and Bêche-de-mer	283, 284	
Pearl and Pearl Shell	281-283	304-306
Flies	296, 297	
Floods	27, 29, 31, 32, 35, 46	
Flora	298-341	
Flour Mills	...	307, 308, 313, 498, 501
Flying Foxes	216, 217	
Forest Resources	341-359	
Trees	343-357	
Sawmills	...	298-301, 498, 500
Forrest, Explorations of Messrs. J. and A. ...	59-62, 64	
Fortifications at Albany and King George Sound	427	
Foundation of Colony	14-18, 371-373	
Franchise, Women's	42	
Free Immigration	...	10, 11

Digitized by Google

Subject.	Vol. I. Pages.	Vol. Pag
Fremantle Lunatic Asylum	...	39
Water Supply	477	
Harbour Works	431-438	
Fresh Fruit, Imported (1900-1901)	...	21
Friendly Societies	...	385-
Frogs	268, 269	
Fruit Trees, Acreage (1900, 1901)	...	20
Imported (1900, 1901)	...	21
Fruits grown in Western Australia	...	21
Fruit Imports (1892-1901)	...	210,
G.		
Game, Close Season	273	
Reserves for	273-275	
Gaols and Prisons	422	
Prisoners (*see* Law and Crime).		
General Loan Fund (*see* Finance).		
Geography	98-102	
Geological Features	103-135	
of S.W. Caves District	124-129	
Gold	...	232-
Native, Composition of	...	23
Coin and Bullion in Banks	...	345, 34
Alluvial	39, 81-94	
Discoveries	10, 75-94	
Export of	...	81, 89,
Crude, Production to end of 1901	...	28
Value per ounce	...	28
Public Batteries	...	283,
Mining Leases	...	282,
Mining Machinery	...	283,
Mining Accidents	...	292,
Production, Australasian Colonies (1893-1902)	...	29
Mining Companies, Dividends paid	...	294, 29
Obtained from Ore treated (1895-1902) ...	...	28
Annual Production (1886-1902)	...	28
Crude, exported (1897-1902)	...	28
Yield, Total, Crude, Fine, and Value (1886-1902)	...	286-
received at Mint from different Fields ...	...	28
Production of the World (1893-1902) ...	...	295-
in circulation	...	345, 34
Production (1886-May, 1904)	...	490,
Stealing	...	40
Goldfields Water Supply	451-456	
Goldfields—		
Kimberley	...	234,
Do. yield of (1886-1901), also 1902 ...	...	235,
Ashburton	...	238,
Do. yield of (1891-1901), also 1902 ...	...	239,

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
—*continued.*		
yne	...	239, 240
». yield of (1897-1901), also 1902 ...	...	240, 287
:a	...	236, 237
». yield of (1889-1901), also 1902 ...	...	237, 287
·a, West	...	237, 238
». yield of (1889-1901), also 1902 ...	...	238, 287
Hill	...	240-242
». yield of (1894-1901), also 1902 ...	...	242, 287
Murchison	...	244, 245
». yield of (1896-1901), also 1902	...	245, 287
ıison	...	242, 243
». yield of (1891-1901), also 1902 ...	...	243, 287
o	...	247, 248
». yield of (1895-1901), also 1902 ...	...	248, 287
ı Coolgardie	...	248, 249
». yield of (to end of 1901), also 1902	...	249, 287
t Margaret	...	246, 247
». yield of (1895-1901), also 1902	...	247, 287
Coolgardie	...	255-258
». yield of (1896-1901), also 1902	...	258, 288
-East Coolgardie	...	258-262
». yield of (1896-1901), also 1902	...	262, 288
l Arrow	...	253, 254
». yield of (1896-1901), also 1902 ...	...	254, 287
ardie	...	251-253
». yield of (1894-1901), also 1902 ...	...	253, 288
as	...	263, 264
». yield of (1893-1901), also 1902 ...	...	264, 288
rn	...	249, 250
». yield of (1889-1901), also 1902 ...	...	250, 288
ybrook.	...	264, 265
». yield of (1898-1901), also 1902 ...	...	265, 288
ps River	...	266, 267
». yield of (1900-1901), also 1902	...	267, 288
ity unspecified, yield of (1899-1902) ...	...	288
ınt	359-430	
... ...	370-390	
... ...	390-419	
ıonwealth	359-370	
›nsible	378, 379	
·ays (*see* Railways).		
General	370	
ı of Western Australia	370, 371, 381	
... ...	122	
hes Tinfield	85	
.. ..	27, 122	92, 280, 281
l and exported (1847-1901)	...	281
Grammar School	...	370
ys, etc.	95, 96	
›s (Eucalyptus), list of	322	

Digitized by Google

Subject.	Vol. I. Pages.	V
Gum Trees, Red	351, 357	
York	352, 357, 358	
Crimson Flowering	353	
Flooded	353-356	
Yate	354, 357, 358	
Morrell	354	
Blue	355	
Salmon-barked	356	
Gimlet	356	
H.		
Habitations	...	1
Half-caste Aboriginals	...	1
Harbour Works	431-440	
(Fremantle)	431-438	
(Bunbury)...	439, 440	
Hardwoods	342	
Health, Local Boards of	417-419	
Act, Public	417-419	
High School, Perth	...	36
for Girls, Perth	...	
Historical Events	22-50	
History, Early, of Western Australia	1-18	
of Mineral Discoveries	75-94	
Holidays, Public and Bank	...	
Supreme Court	425	
Homes and Orphanages	...	39
Homestead Farms, Free	...	17
Horses (*see* Live Stock).		
Hospitals (*see* Charitable Institutions)	...	39
Husbands, Ages of, at Marriage	...	6
I.		
Identification of Criminals	...	40
Illegitimacy	...	33-
Immigrants, First	20	
Immigration	...	4, 5, 2
and Emigration of Chinese	...	46
Assisted, Free, and Nominated	...	10, 11
Countries from which	...	
Nationalities	...	46
Import Duties, etc.	...	9
Imports	...	74-7, 8
of Australasia	...	
1894-1903	...	480,
at Ports of W.A., 1901-1903	...	
from Australian States	...	89,

Digitized by Google

Subject.	Vol. I. Pages.	Vol. II. Pages.
Imports—*continued.*		
of Agricultural Produce	...	86, 87
of principal Articles	...	82, 83, 85-88, 484
from different Countries	...	75, 76, 480, 482
Notes on	...	85-89
of Farmyard and Dairy Produce	...	86
of Fruit and Vegetable Produce	...	87
of Live Stock	...	85
of Railway Material	...	81, 87
of Wines	...	83
Importation of Live Stock, Regulations	..	227
Indebtedness per head	...	7, 327
Index of Mortality	...	39, 40
Industrial Establishments, Factories and (*see* Factories).		
Legislation	...	380
Industrial Conciliation and Arbitration Act ...	...	380-383
Unions registered	...	383
Disputes	...	383
Trade Unions	...	383, 384
Workers' Compensation Act	...	384, 385
Schools (*see* Charitable Institutions).		
Infantile Mortality	...	43, 44
Infantry	427, 429, 430	
Infirmity, Sickness and	...	25
Inquests	...	415
Inspection and Disinfection of Vine Cuttings, Fruits, Plants, Trees, etc.	...	212-217
Insect Pests Act	...	212
Insects	285-297	
Insurance, Fire (*see* Fire Insurance)		
Life, Fire, Marine, and Accident	...	353-361
Institutions, Literary (*see* Associations).		
Native	209, 210	395
Charitable	...	392-397
Interchange	...	74-164
Interest on Bank Deposits	...	344
Public Debt	...	328
Savings Bank's Deposits	...	350
Interior, Climate of the	140-141	
International Statistical Institute	...	1
Intestates' Estates	...	427
Iron	93	275, 276
produced to end of 1901	...	276
Islands	96	
J.		
Jam Wood (*Acacia Acuminata*)	318, 349, 357	
Jarrah (*Eucalyptus marginata*)	322, 343-345, 357-359	

Digitized by Google

Subject.	Vol. I. Pages.	
Jetty and Wharf Accommodation	441-443	
(Fremantle)	438	
Justice, Administration of	420-426	
Juvenile Crime	...	4
K.		
Kangaroos	212-216, 218, 219	
Kangaroo Paw (*Anigozanthos*)	304, 336	
Kaolin	122	
Karri (*Eucalyptus diversicolor*)	322, 345-347, 357-359	
Kennedya	302, 317	
King George Sound, Settlement at	13	
King's Park	490	
L.		
Labour Bureau	...	
Labourers, Wages of	...	313
Lakes	97	
Land	...	1
Districts	...	
Settlement	...	1
Conditional Purchases	...	1
Divisions	...	1
Rents, Mortgages, Transfers, etc.	...	1
Statistics	...	1
Titles	...	1
Reservations for Public Purposes	...	
under Cultivation (*see* Agriculture).		
Conditional Purchase, Deferred Payment with Residence	...	1
Conditional Purchase, Deferred Payment without Residence	...	
Conditional Purchase, by Direct Payment ...	...	
Conditional Purchase, Gardens, Vineyards, and Orchards	...	
Conditional Purchase, Grazing Lands, 2nd and 3rd Class	...	
Conditional Purchase, Poison Lands	...	
Free Homestead Farms	...	17
Working Men's Blocks	...	17
Pastoral	...	17
Pastoral, within Goldfields and Mining Districts	...	17
Timber	...	17
Occupation of (1901-1902)	...	
Lands, Town and Suburban, Sales by Auction of	...	

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
ands, Timber, Licenses and Leases	...	178, 179
Crown, Transactions, 1900-1904	...	494
atitude and Longitude of Western Australia	95, 98	
of Western Australian Townsites	100-102	
of Australasian Capitals	102	
aw, Crime, etc.	...	397-427
Card System	...	398, 399
Offences, Commitments, etc.	...	399-407
Summary Convictions	...	401, 402
Indictments and Informations in Superior Courts	...	402, 403
Punishments Inflicted	...	403, 404
Drunkenness	...	404
Lunacy resulting from Drink	...	404, 405
First Offenders Act, Charges	...	405
Juvenile Crime	...	405-407
Recent Enactments	...	407
"Evil Fame"	...	407
"Gold Stealing"	...	407
Identification of Criminals	...	407-409
Police Commissioner's Conference	...	409, 410
Court Sessions	...	410-415
Courts of Quarter Sessions	...	410
Courts of Petty Sessions	...	411-415
Examinations of Lunatics	...	415
Coroners' Inquests	...	415
Civil Cases (*see* Supreme Court).		
Police Force, Strength of	...	415
Gaols and Prisoners	...	415-426
Nationalities of Prisoners (1902)	...	419
Aboriginal Prisoners (1902)	...	418
Ages of Prisoners	...	420
Religion of Prisoners	...	421
Education of Prisoners	...	421
Classification of Offences	...	422, 423
Prisoners' Sentences	...	423, 424
Nationality and Crime	...	424
Conjugal Condition of Prisoners	...	425
Management of Prisoners	...	425, 426
Civil Law	...	426, 427
Supreme Court Business	...	426, 427
Local Courts	...	427
Wardens' Courts	...	427
aw Students	423, 424	
ead	...	270-272
Ore Exported (1850-1901)	...	271
Pig, Exported (1853-1901)	...	272
and Copper	75-79, 81, 93, 94	
egal Practitioners' Act	422-424	
egislative Assembly	387-390	
Electors	388-390	
Electoral Districts for	387	
Members	389, 390	

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
Legislative Council, old form	24, 375-378	
present form	384-386	
Electors	385, 386	
Members	385, 386	
Legislative	384-390	
Council, Electoral Districts for	384	
Length of Residence in the State	...	24, 25
Leschenaultia	303, 329	
Letters, Postcards, etc.	...	154, 541
Letters, Dead	...	155, 156
Liabilities, Bank (*see* Banks of Issue).		
Library, Victoria Public	484-486	
Licenses, Municipal	398-400	
Revenue from	...	318, 319
Life Assurance (*see* Assurance).		
Life Table, Western Australia	...	64-74
Lighthouses and Jetty Lights	446-450	
Limestone	113	280
Raised	...	280
Caves	124-135	
Literary Institutions (*see* Associations).		
Live Stock (*see* Stock).		
Regulations *re* Importation of	...	227
Loans, Public (*vide* Public Debt).		
Municipal	407-412	
Local Courts, Sittings	426	
Government	390-491	
Boards of Health	417-419	
Lunacy from Drink	...	404, 405
Lunatic Asylums	...	395
Lunatics, Examinations of	...	415
M.		
Machinery, Mining, Value of	...	283, 289
Magpies (*Gymnorhina*)	226	
Mail Contracts	...	151, 152
Do. W.A. share in	...	152
English, Time occupied in Transmission of ...	...	152
Service, English, Foreign, and Intercolonial	...	151, 152
Service, European	...	151
Manufactories (*see* Factories).		
Marine Insurance	...	361
Mark Signatures	...	59
Marriage, Ages at	...	60-62
Law	...	23, 63, 64
Rates, Australasian	...	64, 523
Conjugal condition at	...	62, 63
Rates, Metropolitan, etc.	...	58, 59
Rates	...	56-59, 62-64

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
Marriages	...	56-64
1894–1904	...	467
Of Minors	...	61, 62
Celebration of	...	59, 60
In Seasons	...	57, 58
Married Persons	...	22, 23
Marsupials	212-216	
Mean Population	...	7
Meats, Imported	...	201
Mechanics' Institutes	...	391
Mesozoic Rocks	111-113	
Meteorological Statistics, 1903	...	505, 506
Meteorology	135-157, 486-489	
Methodist Church	...	379
Metropolitan Water Works	36, 476	
Mica	92	277, 278
Mica Exported (1892-1901)	...	278
Midland Railway	...	105, 144, 145
Military Defences	427-430	
Mineral Discoveries	75-94	
Production	...	232-297
Products (to end of 1901), Value of	...	232
Minerals other than Gold, Total Production of ...	...	290, 291
Of Western Australia, Census of	117-124	
Miners' Institutes (*see* Associations).		
Mining	...	232-297
Statistics	...	282-297, 490, 491, 539
Accidents, Causes and Fields	...	292
Accidents, Summary for Fields (1897-1901)	...	293
Ministries, Western Australia	381-383	
Minors, Marriages of	...	61, 62
Mint, Royal (Perth Branch)	479, 480	
Missions, Native	209, 210	395
Money Orders	...	157, 158
Mortality Table	...	64-74
Index of	...	39, 40
Infantile	...	43, 44
Rates of	...	38-40, 44-46, 64-74
Moths	294	
Mountains	96, 97	
Municipalities	390-413	
Constitution of	392	
Municipal Legislation	390, 391	
Councils, Powers of	398-402	
Councils	392, 393, 397-402	
Elections	393-397	
Finance	402-413	
Valuation	404	
Loans	407-412	

Digitized by Google

Subject.	Vol. I. Pages.	Vo P
Municipal Accounts	413	
Museums and Art Gallery	159, 160, 481-483	
N.		
Native Prison, Rottnest	211	
Native Institutions	209, 210	
Natives (Aborigines)	196-211	2
Native Animals, etc., Legislation on	273-275	
Natural Increase of Population, 1891-1901 ...	...	
Naturalisation	...	
Naval and Military Expenditure	428	
Naval Defences	427, 428	
New Norcia, Abbey Nullius	...	
Native Institution	209, 210	
Newspapers	...	426,
Nominated Immigrants	...	
Nuytsia	307, 323	
O.		
Observatory, Perth	160, 486-489	
Observations, Meteorological	135-157	
Occupations of the People	...	:
Offences (*see* Law and Crime).		
Opossums	212-214, 218	
Orchards	...	2
Vineyards, and Nurseries, Registration of ...	...	2
Orchids	303, 304, 335	
Ores, other than Gold, Total Production of ...	...	2
Ornithology	211, 220-261	
Orphanages (*see* Charitable Institutions).		
Oyster Fishery	284	
P.		
Paper Bark (*Melaleuca*)	321, 357	
Parcel Post	...	15
Parents, Ages of	...	3
Parliament	384-390	
Federal	368, 369	
Park, King's	490	
"Parmelia," Passengers by	20	
Parrots	243-248	
Pastoral Industry	...	22
Leases (*see* Lands).		
Pearls, Discovery of	27, 28	
and Pearl-shell, Export of	...	9
Pearl and Pearl-shell Fisheries	281-283	3

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
Pearling, Nor' West	...	306
Shark Bay	...	306
Penal Commission	41, 42	
Perth, City of	158-160	
Branch, Royal Mint	479-480	
Climate of	135-138	
Peppermint tree (*Agonis flexuosa*)	321, 349, 350	
Phthisis	...	52
Physical Features	95-98	
Pigs, Poultry, and Bees	...	227, 228
Plants	298-341	
Ornamental	306, 307	
Poisonous	305, 306	
Poison Lands, Conditional Purchase of (*see* Lands).		
Police Courts	422	
Poor Houses	...	392
Population Statistics	...	1-8, 462, 510-514, 519-521
Census, 1848 to 1901	..	2
1830-1901	...	6
Standard	...	39, 40
Metropolitan	158	8, 514, 519
of Fremantle (1903)	...	514
Australasian Capitals	...	8, 519
Australasian Colonies	...	8, 520
Principal Towns	158-195	512-514
Municipalities	391	512, 513
Roads Board Districts	414, 415	
Mean	...	7, 462, 521
Chinese	...	28
Ports, Boundaries of	444, 445	
Position, Geographical, of Australasian Capitals ...	102	519
Geographical, of Western Australia	95, 98	
Geographical, of Western Australian Townsites	100-102	
Postage Stamps, First...	28	
Stamps and Post Cards	...	157
Rates of	...	151
Post Office Money Orders	...	157-158
Savings Bank	28, 29	349-353
Travelling	...	152
Post, Parcel	...	156, 157
Inter-State	...	156
U.K. and Foreign	...	157
Postal Department, first established	25	
Service	...	151-158
Notes	...	154, 155
Letters, etc. (1900-1902)	...	154, 541
Returns	...	153, 154, 540, 541
Returns, Decennial	...	153
Unclaimed Letters	...	155
Union	...	151

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
Postal Department, Revenue and Expenditure ...	...	153
Postcards	...	154, 541
Poultry, Pigs, and Bees	...	227, 228
Statistics (1896-1901)	...	228
Presbyterian Church	...	379
Prices of Articles of Consumption	...	431-434
Principal Towns, etc.	158-195	
Prison, Native (Rottnest)	211	
Prisons, Gaols and	422	
Prisoners, Gaols and (*see* Law and Crime).		
Private Bonding Warehouses	...	103, 104
Schools (*see* Education).		
Privy Council, appeal to	422	
Probate	...	426, 427
Products of the State Exported	...	81, 84, 89-92
Production of Gold (*see* Gold).		
Protection of Aborigines	208-211	
Public Batteries on the Goldfields	...	283, 289
Public Debt	..	326-333, 474, 529-532
Return per head (1893-1902)	...	327
Rates of Interest	...	328
Years when due	...	329
Loans 1901-2, Details *re*	...	330-332
Loans raised from 1894 (Particulars *re*) ...	...	332
Sinking Funds	...	332, 333
Loan Expenditure	...	323-326, 475, 527, 528
1894-1903	...	474
Works, Loan Expenditure on	...	323-326, 475, 527, 528
Schools (*see* Education).		
Holidays	...	437
Library, Victoria	159, 484-486	
Q.		
Quarter Sessions, Courts of	425, 426	
R.		
Railways and Tramways	...	104-150, 486-488, 542
Railway Statistics, Australasian	...	542
Railways, Private Lines	...	144-147
Government—		
History of Construction...	...	104-110
Mileage of	...	108, 486, 542
Statistical Summary (1879-1903)	...	109
Cost of Construction	...	110, 111, 488, 542
Contracts, Cost per mile	...	110
Capital Cost per mile, etc. (1893-1903)... ...	...	111

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
Railways, Government—*continued.*		
Rolling Stock	...	111-115, 486, 542
Rolling Stock, Capital Debit (1896-1903) ...	...	112
Locomotives	...	113
Carriages	...	114
Brake Vans	...	114
Wagons	...	115
Under Construction	...	115, 116
Administration	...	116-122
Organisation	...	122-126
District Superintendents	...	123
Resident Engineers	...	124
Expenditure	...	124, 125, 141 142, 487
Description of Lines	...	126-130
Eastern Railway	...	126
Goldfields Railway	...	127
South-Western Railway	...	128
Great Southern Railway	...	129
Northern Railway	...	130
Safe Working Appliances	...	130, 131
Water Supply	...	132, 133
Result of Working (1894-1903)...	...	134, 135, 488, 542
Net Profit Return (1895-1903)	..	136, 488
Results in relation to Population (with decennial returns)	...	136-138
Classification of Traffic, Revenue, and Expenditure	...	138-142, 486, 542
Classification of Receipts (1899-1903)	...	138
Classification of Traffic (1899-1903)	...	139
Description of Goods (1899-1903)	...	140
Facilities for Travel	...	143
Development of Industries	...	143
Revenue (1894-1903)	...	487
Railway, Transcontinental, Proposed	45, 48, 73-75	148-150
Telephone Lines	...	164
Rainfall	136, 137, 142, 143, 150-157, 486-489	
of Out-stations	142, 143, 152-157	
Perth	136, 142, 143, 150, 151, 155	
Rates, Municipal	403-405	
Registered Births, Deaths, and Marriages ...	...	29-64, 467, 521-523
Registration of Orchards, Vineyards, and Nurseries	...	216
Religions of the People	...	20, 21
Religion	...	371-379
Census Returns	...	371-376
Church of England	...	373, 377, 378

Digitized by Google

Subject.	Vol. I. Pages.
Religion—	
Roman Catholic Church	...
Methodist Church of Australasia	...
Presbyterian Church	...
Congregational Church	...
Other Churches	...
Rents, Land (*see* Lands).	
Reptiles	261-268
Reservations for Public Purposes (*see* Lands).	
Residence, Length of	...
Respiratory System, Diseases of the	...
Responsible Government	378, 379
Revenue, 1902-1904	...
and Expenditure (*see* Finance).	
and Expenditure per head of Mean Population	...
from Customs	...
and Expenditure, State and Commonwealth, 1894-1904	...
Commonwealth (W.A.)	...
State and Commonwealth (W.A.), per head	...
Rivers	97
Roads Boards, District	413, 416
Roebourne-Cossack Tramway	...
Rolling Stock on Railways (*see* Railways).	
Roman Catholic Church	...
Rottnest Island	122, 190, 211
Salt	122, 211
Native Prison	211
Reformatory (*see* Charitable Institutions).	
Royal Mint, Perth Branch	479, 480
Visits	31, 34, 48, 49, 370
S.	
Salt	114, 122, 211
Sandalwood (*Santalum cygnorum*)	323, 348, 357
Exports	...
Savings Bank	. .
Transactions, 1894-1904	
Trust Funds	..
Branches of	..
Sawmills, Returns of	...
Scholarships (*see* Education).	
Schooling	.
Schools (*see* Education).	
Private (*see* Education).	
Scotch College .. .	.
Separation Movement	44, 364, 365
Sessions, Courts of General	421
Courts of Quarter	427, 428

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
Settlement, Early, and Colonisation	19-22, 371-373	
First	13-22	
Extent of	98, 99	
Land (*see* Lands).		
Sheriff	421	
Shipping Population	...	13, 15
Shipping	...	94-103, 479, 533
Vessels Entered and Cleared	...	94, 95, 479, 533
Ports, Steamers and Sailing Vessels at ...	...	96, 97
Ports, Customs Revenue and Trade	...	97
Decennial Table	...	98
Nationalities of Vessels	...	98, 99
Commonwealth, etc.	...	100, 101
With Cargo or in Ballast	...	100
On W.A. Register	...	102
On W.A. Register, Decennial Table	...	103
Facilities	...	437-457
P. & O. S.N. Company	...	437, 438
Orient S.S. Company	...	439
North German Lloyd Co.	...	439, 440
Messageries Maritimes Company	...	440, 441
Bethell, Gwyn, & Co. and Trinder, Anderson & Co. } Sailing—London to Fremantle	...	446, 451
W.A.S.N. Co.	...	443-446
Adelaide Steamship Company	...	446-450
Howard Smith Co., Ltd....	...	450
Huddart, Parker, & Co.	...	451
McIlwraith, McEacharn, & Co.	...	451, 452
A.U.S.N. Co.	...	452-454
Direct Line of Sailing Vessels from Hamburg to Fremantle	...	454
German Australian Steamship Company ...	...	454, 455
Melbourne Steamship Company	...	455
White Star Line	...	442
Aberdeen Line	...	443
Lund's Blue Anchor Line	...	455, 456
British India S.N. Co., Ltd.	...	456
New Zealand and South African Steamship Company	...	456, 457
James Bell & Co.	...	457
Sickness and Infirmity	...	25
Silurian Rocks	106, 107	
Silver	...	276, 277
Produced and Exported (1900, 1901)	...	277
Sinking Funds, Municipal	411, 412	
Public Debt	...	332, 333
Societies, Friendly (*see* Friendly Societies).		
Spiders	297	
Stalactites and Stalagmites	127, 128	
Standard Population	...	39, 40
State Schools (*see* Education).		
Statistics of Western Australia	...	461-518

Digitized by Google

ALPHABETICAL INDEX—*continued.*

Subject.	Vol. I. Pages.	Vol. II. Pages.
Victoria Public Library	484-486	
Vine Cuttings, Fruit, Plants, etc., Inspecting and Disinfecting	...	212-217
Vines, Cultivation of	...	206-219, 495, 496
Acreage under (1900, 1901)	...	209
Vines and Fruit Trees	...	206-219, 495, 496
Fees for Inspection	...	213, 215
Vital Statistics...	158	29-64, 467, 521-523
Volcanic Rocks	116, 117	
Volunteer Reserve Force	428	
W.		
Wages	...	313, 428-430
Wandoo (*Eucalyptus redunca*)	322, 351, 352, 357, 358	
Warehouses, Bonding	...	103, 104
Water Spout, Perth Water	31	
Water Works, Metropolitan	36, 476	
Water Supply	451-478	
Fremantle	477	
Coolgardie Scheme	451-455	
For Goldfields	451-456	
Reservoirs or Wells	478	
Northern Stock Routes	455, 456	
Wharf and Jetty Accommodation	441-443	
Fremantle	438	
Wheat Production (1902-3, 1903-4)	...	192-198, 495-497, 518, 536, 537
Breadstuff Returns	...	195, 515-517
Widowed Persons	...	22, 23
Wine, Production of	...	206-209, 219, 495, 496, 536, 537
First Export	28	
Wives, Ages of, at Marriage	...	60, 62
Wool Exported	25	90, 91, 485, 534
Working-men's Blocks (*see* Lands).		
Works, Defence	427	
Harbour	431-440	
World's Gold Production (1893-1902)	...	295-297
Z.		
Zinc	77, 118	
Zoological Gardens	159, 489, 490	
Zoology	211-297	

By Authority: Wm. Alfred Watson, Government Printer, Perth.

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google

Digitized by Google